

In the Matter of: )  
 )  
2005 BUILDING ENERGY EFFICIENCY )  
STANDARDS )  
\_\_\_\_\_ )

MONDAY, APRIL 22, 2002

10:03 A.M.

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

COMMISSIONERS, ADVISORS PRESENT

Arthur Rosenfeld, Commissioner

STAFF AND CONSULTANTS PRESENT

William Pennington

Bryan Alcorn

Tav Commins

Martha Brook

Elaine Hussey

Elaine Hebert

Larry Luskay  
Portland Energy Conservation, Inc.

Don Felts

ALSO PRESENT

Jeff Johnson  
New Buildings Institute

Charles Eley  
Eley Associates

John E. Otto  
California Department of General Services

Richard Conrad  
California Department of General Services

Thomas Trimberger  
California Building Officials

A.Y. Ahmed, Consultant  
Southern California Gas Company

Kurt Kaufman  
Sempra Energy Utilities

Robert Burt  
Bobburt

ALSO PRESENT

Ken Gillespie  
Pacific Gas and Electric Company

Tony Pierce  
Southern California Edison Company

John Hogan  
City of Seattle

Richard Flood  
New Buildings Institute

Jim Edelson, Project Manager  
New Buildings Institute

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## P R O C E E D I N G S

10:03 a.m.

MR. COMMINS: I want to welcome you all coming today to this acceptance requirements workshop. One of the things I wanted to remind you about is we do have a recorder here, so when you come up to the mike or when you speak, please state your name and make sure that you speak into the microphone. We do have two more seats up here if you'd like to come up to the table.

Also, we have a sign-in sheet, so if you'd please either sign in now or during lunchtime we'd appreciate that.

We have a pretty tight schedule here. We've got to finish up at 3:00. We've got copies of the PowerPoint presentation that Chris is going to be handing out. As I mentioned we're going to have to finish up at 3:00 so we're going to have to be moving along. So, if things get bogged down and we start getting over time I'm going to have to cut you off.

At approximately 1:30, 1:40, we are going to have our third presenter, Don Felts. He will be calling in.

I just wanted to let you know that this

1 is an SEP funded project. The DOE is paying for  
2 this. We've been working on this project for  
3 approximately two years now, and this is a two-  
4 phase project because of DOE funding.

5 The first phase completed about four or  
6 six months ago. And Jeff Johnson is going to  
7 start out on that, what the first phase is all  
8 about, what we found out. So, Jeff, if you'd take  
9 it away.

10 MR. JOHNSON: Before we do that, it's  
11 not a huge group here. Is it possible to go  
12 around the room and just do introductions and  
13 start? I'm Jeff Johnson with New Buildings  
14 Institute.

15 MR. ELEY: Charles Eley with Eley  
16 Associates, a contractor to the Commission on  
17 standards.

18 MR. PENNINGTON: Good morning, I'm Bill  
19 Pennington. I'm the Manager of the building  
20 standards development project for the 2005  
21 standards.

22 And I just wanted to add that this is an  
23 area that we started work on at the Commission  
24 right after the 1998 standards. And we view it as  
25 a quite important subject area.

1           We view sort of the status quo here as  
2           being problematic. That often equipment that is  
3           required by the standards is not installed as  
4           designed or as required by the standards. And we  
5           think that's a serious problem.

6           And so in a joint grant with PG&E and  
7           NBI that was funded through DOE we started work on  
8           this shortly after the 1998 standards came  
9           forward.

10          I think we have a very good starting  
11          point for trying to address these problems. And I  
12          just wanted to let you know that we view this as a  
13          high priority activity.

14          MR. ALCORN: Thank you, Bill. I'm Bryan  
15          Alcorn, the Contracts Manager for the 2005  
16          building standards.

17          MR. COMMINS: Tav Commins; I'm actually  
18          the Project Manager for this contract.

19          COMMISSIONER ROSENFELD: I'm Art  
20          Rosenfeld, one of the two CEC Commissioners on the  
21          Energy Efficiency Committee.

22          MR. OTTO: John Otto representing  
23          General Services Project Management Branch.

24          MR. CONRAD: Richard Conrad with the  
25          Division of the State Architect.



1 MR. TRIMBERGER: Tom Trimberger  
2 representing California Building Officials.

3 MR. AHMED: A.Y. Ahmed, Consultant to  
4 Southern California Gas Company.

5 MR. KAUFMAN: Kurt Kaufman, representing  
6 Sempra Energy Utilities.

7 MR. LUSKAY: Larry Luskay, Portland  
8 Energy Conservation, Incorporated.

9 MR. BURT: Bob Burt, Installation  
10 Contractor Association. My only background here  
11 is a former residence engineer in the Corps of  
12 Engineers. So I'm here to learn more than to  
13 participate.

14 MR. FLOOD: I'm Richard Flood with the  
15 New Buildings Institute, California office.

16 MR. EDELSON: Jim Edelson with New  
17 Buildings Institute; I'm a Project Manager.

18 MS. BROOK: Martha Brook, California  
19 Energy Commission.

20 MR. GILLESPIE: Ken Gillespie, Pacific  
21 Gas and Electric.

22 MS. HUSSEY: Elaine Hussey, part of the  
23 2005 standards team.

24 MS. HEBERT: Elaine Hebert, not to be  
25 confused with Elaine Hussey, from the 2005

1 standards team.

2 MR. JOHNSON: Well, thank you for coming  
3 today. As Bill and Tav mentioned, this project's  
4 been underway for some time. It sort of came out  
5 of some early thoughts about where things might  
6 need to go with the standards.

7 Actually a little further background,  
8 there are a couple places in the standards, back  
9 even in '92 we were considering, you know, how do  
10 we deal with some assurances that things happen.

11 For example, in the outside air systems  
12 there's a completion and balancing section, or in  
13 the existing standard. And so while this project  
14 is a little more ambitious and had been done in  
15 the past in terms of trying to look at other areas  
16 where we can try and assure that building  
17 performance occurs, I think that there's some  
18 precedence in both California standards and also  
19 in some other standards.

20 Seattle has commissioning requirements  
21 in their City building code, now. The State of  
22 Massachusetts has done some work in developing and  
23 putting together acceptance requirements for their  
24 state building code, as well as ASHRAE has  
25 commissioning requirements in their code.

1           So this is really trying to find out  
2       what would work best in California in terms of  
3       trying to address the situation where you try and  
4       really look at effective energy savings, or what  
5       not only occurs on paper but what really occurs in  
6       the building. And so I think that's really been a  
7       guiding part of this project.

8           So, I'm going to go ahead and just give  
9       you a little bit of background on where we've  
10      been. There have been a few meetings that we've  
11      hosted here at the Commission to talk about the  
12      phase one study, as well as where to go with the  
13      types of equipment to be tested. And we're going  
14      to summarize that briefly, and then talk a little  
15      bit about what the proposal is for the 2005  
16      standards.

17          First of all the project is -- Portland  
18      Energy Conservation, Inc., Don Felts Consulting  
19      are also participating in this project. And we've  
20      also had the support of an advisory committee with  
21      representatives from the utilities, laboratories  
22      and others.

23          The goal is how do you -- to try and  
24      prove the construction quality of new  
25      nonresidential buildings. And there's been a lot

1 of focus, I think some of the PIER research, as  
2 well as just a lot of anecdotal information on the  
3 performance of nonresidential buildings, and it's  
4 a pretty mixed bag right now in terms of  
5 performance.

6 And while they may be performing assets  
7 and they may keep occupants comfortable, some of  
8 the systems in those buildings are definitely sub  
9 optimized and not performing well.

10 And so we wanted at least -- how could  
11 we make sure that starting out, when they're  
12 handed over to the building operator, some of  
13 these systems are working properly.

14 This project has been a multi-year  
15 project, and I'm going to talk a little bit about  
16 the first phase right now.

17 The first thing we did was we put  
18 together the existing -- looked at all the  
19 existing technical literature that was out there  
20 on performance of systems. Did a survey where we  
21 talked to code officials, engineers, contractors  
22 in the state about attitudes about how we might be  
23 implementing this particular project.

24 And then looked at identifying some  
25 alternative approaches to the traditional code

1 enforcement. And I think some of those  
2 alternatives included things that are in  
3 traditional code enforcement, but may not be used  
4 within the standards, as well as other mechanisms  
5 that we could look at.

6 And some of those included -- the issues  
7 we needed to deal with are listed on the slide,  
8 and they included what's the protocol for doing  
9 field verification; how do we deal with this  
10 process; what do we call it; how does it fit into  
11 other pieces like commissioning, the code  
12 inspection process.

13 What's the role of the building  
14 department; the building officials, what kind of a  
15 role do they play, and where does this fit within  
16 their process.

17 We talked about the results of this  
18 report and got some feedback and comment on that.  
19 And put out a final report on recommendations.  
20 The final report is available on our website at  
21 newbuilding.org; it's listed there. You can also  
22 get it through the Energy Commission. And it's a  
23 fairly comprehensive first cut at what this  
24 project was trying to accomplish.

25 The options that we looked at for

1 implementation, though, I think were really the  
2 areas where I think the areas we really tried to  
3 focus on, and I think have evolved into what we  
4 present today.

5           There were a few models we could look  
6 at. One is the residential field verification  
7 model, and that's currently being used for duct  
8 systems, where the CHEERS rater verifies that the  
9 duct leakage is within a certain threshold, and  
10 then you can get a compliance credit for that.  
11 And that's one option to go with.

12           We also looked at potentially creating  
13 new certification options. CABEC has a  
14 certification, it's the California Association of  
15 Building Energy Consultants. There are some  
16 models there that we could have looked at.

17           The code, itself, has a category of  
18 something called special inspector. And within  
19 the building code there's a fairly defined scope  
20 for these special inspectors. One example is  
21 structural observation. Structural calculations  
22 are clearly a complex issue. Many times there's a  
23 simulation involved, and the building department  
24 has the authority to call in a special inspector  
25 for structural observation where they can go ahead

1 and verify that the construction proceeded  
2 according to the plan specifications and  
3 structural requirements. So that's one model that  
4 we can also look at.

5 And there was also some discussion in  
6 the AB-970 process of a process that would require  
7 acceptance of building systems. And that was  
8 another piece that we looked at.

9 So these were sort of different options  
10 that we considered in terms of implementing some  
11 way of verifying the performance of systems prior  
12 to an occupancy permit.

13 So we moved into phase two, which is  
14 what we're currently in, and this is the project  
15 we're currently working on right now, which is  
16 trying to develop some specific proposals for the  
17 standards.

18 And there was an earlier report produced  
19 in phase two. It's available outside. And I  
20 think you have may have picked up a copy called  
21 acceptance requirements for nonresidential  
22 buildings, dated April 8th.

23 And that particular report contains the  
24 current proposal for this, out of this phase two  
25 work.

1           Next. Now, we've been around a bit on  
2 terminology. We started with performance  
3 verification. We've talked about commissioning;  
4 we've talked about acceptance requirements; and  
5 we've sort of stuck on this term called acceptance  
6 requirements, or acceptance testing.

7           And we did that for a couple of reasons.  
8 I guess one is that the world of commissioning  
9 does exist out there, and there's an effort  
10 underway in the State of California through the  
11 California Commissioning Collaborative to promote  
12 commissioning in the state.

13           And it was pointed out, and I think it's  
14 an important thing to note, is that the  
15 requirements that we're proposing are a piece of  
16 the work that would be required to commission a  
17 building. It's not a substitute for.

18           And we wanted to make sure that because  
19 it was a piece of it, it fit well within the  
20 commissioning process. We didn't want to have a  
21 process that sort of stepped outside of that  
22 world. You're trying to promote it in the state,  
23 and yet you're developing a separate process  
24 that's going to be kind of counter to where we're  
25 trying to go.



1           And so we've called it the term  
2       acceptance testing. And the definition is really  
3       looking at targeted inspection checklists,  
4       functional performance testing to determine  
5       whether the specific buildings components,  
6       equipment systems and interfaces between systems  
7       conform to the criteria set forth in the standards  
8       and the related construction documents.

9           So what we're really trying to do is go  
10      beyond verifying whether that measure is present  
11      or not, but is it performing according to the  
12      intent of the standards as installed by the  
13      contractor.

14          There's a big difference between a  
15      physical inspection and inspecting for actual  
16      performance of that system. And what this  
17      proposal is about is trying to make sure those  
18      systems are performing.

19          And this fits within the compliance  
20      process. If you look at the slide that I put up  
21      here, there's a couple things. I guess in the  
22      dark lettering it says design, construct, startup,  
23      operate and maintain. And those are sort of the  
24      phases of a commercial building's life.

25          We tend to focus on this first piece

1       which lasted a few years, even though the building  
2       may be around for 50 to 70 years. And within that  
3       first phase, within the code you've got a whole  
4       compliance documentation process. And there's an  
5       existing certificate of compliance that's required  
6       that's a part of that.

7               And so then there's a field inspection  
8       that's done by the building officials. And then  
9       the building receives a certificate of occupancy.  
10      Is allowed -- they start up the building; operate  
11      it; maintain it; what-have-you.

12             And there's different groups involved.  
13      The building design team is typically involved  
14      more in the front end, construction team obviously  
15      onsite, and during construction process; and the  
16      operations team sort of inherits this project.

17             What we're proposing to do is add a few  
18      steps, a few pieces within this process. One of  
19      the pieces we're talking about adding is something  
20      called a certificate of acceptance. It sort of  
21      mirrors the certificate of compliance, but the  
22      goal here is to create a document that someone,  
23      basically a person who is licensed under the  
24      Business and Professions Code to work on these  
25      buildings, and to design or install these systems,

1 signs and says yes, these things are installed and  
2 performing according to the intent of the  
3 standard.

4 It also captures some other things that  
5 are in the existing standard that are sort of  
6 overlooked, particularly in title 20, that have to  
7 do with installation certificates and operations  
8 manuals. Those are other pieces that are  
9 currently in there that we're collecting and  
10 putting in the certificate of acceptance.

11 The other piece that's being added is  
12 this testing requirements. And this does not  
13 apply to all systems. And we'll go though a  
14 little later on this morning and talk specifically  
15 about what systems testing would apply to.

16 But what this means is that rather than  
17 just install the piece of equipment, the  
18 contractor would actually have to perform a series  
19 of tests and certify that those tests were met by  
20 their installation.

21 Now, our discussion with contractors it  
22 turns out that a number of contractors are already  
23 doing this. This is not new business. This is  
24 something that people do. But not all people do,  
25 and it takes some extra effort. In some cases

1       it's going to be outside the scope of what a  
2       normal contractor may do.

3               But, you know, when you look at this  
4       process testing of equipment and the tests that  
5       we've outlined are not unlike what someone would  
6       do as a normal course of doing business, to show  
7       that their system is functioning prior to getting,  
8       to concluding the contract, to finishing the  
9       contracted work.

10              I mean, that's the way we've tried to  
11       couch these tests. This is something that someone  
12       would do in the normal course of business, if they  
13       were going to deliver a quality system to a  
14       building owner per their contract.

15              Many times this stuff's required already  
16       by existing plans and specifications. The  
17       challenge is that it's not always happening. And  
18       we're trying to say, okay, if you're going to sign  
19       this piece of paper, this certificate of  
20       acceptance and state that you did perform these  
21       tests, then we hope that's a little extra impetus  
22       to actually do that work.

23              The other piece that's going to be  
24       required is the inspection, and this will be again  
25       the contractor saying yes, we not only put this

1 equipment in, but we've done the testing.

2 And then finally the record drawings.

3 Now record drawings are currently not required in  
4 the standards, and what we're proposing is to add  
5 a clause that states that record drawings are to  
6 be delivered to the building owner within 90 days  
7 of the issuance of a certificate of occupancy.

8 Now, this is not something we're going  
9 to be hinging on the certificate of acceptance,  
10 but during the inspection phase there will be, you  
11 know, someone will have to make sure that the  
12 specifications and the plans state that record  
13 drawings are provided to the building owner.

14 Turns out that the key pieces of  
15 information to operate a building properly are the  
16 maintenance information, the operations  
17 information and the record drawings. Maintenance  
18 and operations are currently in the standards.  
19 They're required already. What we're doing is  
20 adding a clause that record drawings be also  
21 provided to the building owner.

22 Again, it's standard for most contracts.  
23 We're saying it should be standard for all to be  
24 able to get buildings to operate properly, and for  
25 people to be able to actually keep them operating

1 over their life.

2 So these are the key changes that we're  
3 really talking about adding in this compliance  
4 process through this piece called acceptance  
5 testing.

6 MR. AHMED: Excuse me, Jeff.

7 MR. JOHNSON: Yes.

8 MR. AHMED: When would you like us to  
9 make comments?

10 MR. JOHNSON: I'm just about to a point  
11 where we're ready to go. Let's see here.

12 MR. ALCORN: Jeff, maybe you could make  
13 your presentation and then we'll just take, you're  
14 kind of maybe a little bit ahead of the agenda,  
15 which is a good thing, but we would hold the  
16 questions and comments until Jeff is finished with  
17 his full-on presentation.

18 MR. JOHNSON: And let me, about two more  
19 slides and we'll be at a point we can start  
20 talking about -- so, in the current standards is a  
21 set of existing requirements. And that includes a  
22 certificate of compliance, installation  
23 certificates which apply to items in 110 through  
24 119 of the standards. I've got a list of them up  
25 there.

1           Something called an insulation  
2       certificate for the installed insulation. There's  
3       operation and maintenance information. And then  
4       ventilation information to meet the requirements  
5       of title 8 of the health and safety code. And  
6       these are all existing requirements of the  
7       standards. These are not things we're adding, but  
8       we are gathering these requirements together and  
9       pulling them into the certificate of acceptance.

10           What we'll be doing is in the  
11       certificate of acceptance piece is provide  
12       administrative guidelines for the process of  
13       finalizing the installation of the building. It  
14       will hold those pieces together and it will also  
15       then describe a process for verifying the  
16       performance of the equipment.

17           The certificate of acceptance will be  
18       filed prior to the occupancy permit. Again, that  
19       will be up to the building department's  
20       discretion, I'm sure, but because certificates of  
21       occupancy are issued in various stages for various  
22       buildings. But in general we're expecting, we'd  
23       like to see this as being an instrument that's  
24       used in that process.

25           The scope of these various requirements

1       that we're -- particularly the test requirements,  
2       will be integrated into the standards. And,  
3       again, pulling together these existing  
4       requirements as a part of this process.

5               So, finally our recommendations on this  
6       particular piece -- if you go on to the next  
7       slide, then we can take some questions -- are to  
8       develop acceptance testing requirements for the  
9       following pieces of equipment and systems:

10              The economizer controls; air  
11       distribution systems or ducts; outdoor air system  
12       controls; and those primarily have to do with  
13       ventilation, but could extend into demand control  
14       ventilation devices; HVAC controls, and this would  
15       be primarily temperature and time of day controls;  
16       and also lighting controls. And in particular,  
17       the automatic controls that are required both  
18       through mandatory requirements, as well as when  
19       you're taking your credit for daylighting  
20       controls.

21              The other portion of the proposal then  
22       is to have a certificate of acceptance that would  
23       basically pull the existing requirements together  
24       and also show a sign-off on these particular  
25       pieces of equipment.



1                   So, with that, --

2                   MR. ALCORN: Great. Some questions and  
3 comments now, please.

4                   MR. BURT: Just a clarification in  
5 language, the phrase record drawings; this one's  
6 also used in the trade as as-builts?

7                   MR. JOHNSON: That's correct.

8                   COMMISSIONER ROSENFELD: What was that?  
9 Didn't hear you.

10                  MR. JOHNSON: As-built drawings, yeah,  
11 record drawings, as-built drawings.

12                  MR. AHMED: I was wondering if you  
13 considered maybe acquiring the as-builts, or the  
14 record drawings to be kept at all times with the  
15 building, so that you can, if you need to, verify  
16 future degradation of performance if you want to  
17 go back and check?

18                  MR. JOHNSON: There had been a  
19 recommendation to do that. The concern was that  
20 the scope of the standard and particularly the  
21 scope of the rule of the local building department  
22 sort of ends about when the occupancy permit is  
23 issued, so --

24                  MR. AHMED: Right.

25                  MR. JOHNSON: -- things that happen

1 after that sort of fall outside the typical  
2 inspection process, or the typical scope of their  
3 jurisdiction.

4 And so while it would be a difficult  
5 thing to require because there's no way to enforce  
6 it or no way to verify it. So, at some point you  
7 start to have to be concerned about putting  
8 unnecessary burden on the code officials that goes  
9 outside of their scope. They usually comment on  
10 that, too.

11 So, record drawings, we think, might be  
12 walking a thin enough line already, but it's a  
13 pretty important thing and we felt it was worth  
14 keeping in there.

15 MR. ALCORN: Tom.

16 MR. TRIMBERGER: Tom Trimberger with  
17 CALBO. Couple questions. What does it mean  
18 modeled off the AB-970 proposal?

19 MR. JOHNSON: Okay, there was a proposal  
20 that -- let me back up a little bit. During the  
21 AB-970 process there was a question about whether  
22 or not commissioning should be included in the  
23 standard or not. And I guess essentially we had  
24 put together a proposal to do that. It was partly  
25 done, funded through Pacific Gas and Electric

1 Company's work with the Institute.

2 And we had looked at this particular  
3 process. And the proposal was rejected mostly  
4 because of the timeframe we were operating in.  
5 And so we pulled the proposal, but some of the  
6 pieces of that proposal really looked at  
7 consolidating these existing requirements in the  
8 certificate of acceptance.

9 And so that became kind of, I guess, a  
10 big portion of this particular proposal.

11 MR. TRIMBERGER: Okay, the other  
12 question is the exceptions testing requirements,  
13 if I'm understanding this right, the things that  
14 you're looking at are economizer controls, air  
15 distribution systems, outdoor air system control,  
16 HVAC controls, lighting controls.

17 So, five issues, four of them have to do  
18 with controls, one just says air distribution  
19 systems. Are we looking at duct testing, is that  
20 what that is referring to?

21 MR. JOHNSON: Yes, it is.

22 MR. TRIMBERGER: That's an option in the  
23 standards right now.

24 MR. JOHNSON: Yes.

25 MR. TRIMBERGER: Are we looking at doing

1 something similar to that?

2 MR. JOHNSON: That's actually a good  
3 point to bring up. We talk a lot about this issue  
4 of acceptance testing. And the difference between  
5 acceptance testing and what's in the standard  
6 right now, which we're calling field verification,  
7 is that acceptance testing is done by the  
8 installing contractor, mechanical engineer, a  
9 commissioning agent and contractor, but  
10 essentially it's an agent of the owner.

11 The current standards proposal requires  
12 field verification which is done by an independent  
13 third party. And so I think that's the key  
14 difference between what we're proposing here and  
15 what's in the current standards, is that this  
16 would not require third-party independent field  
17 verification.

18 The other thing that I'll say about the  
19 duct testing is you would also not receive a  
20 credit for this in the ACM process. So, under the  
21 alternative calculation methods, the process right  
22 now, third-party field verification does allow for  
23 a credit if you meet the criteria. In this  
24 particular case it would not.

25 MR. TRIMBERGER: Okay, so these testing

1 requirements, it's something by the installing  
2 contractor or the designer saying that they had  
3 reviewed the system as installed, and it does meet  
4 the requirements, and fills out the forms and  
5 checks the boxes?

6 MR. JOHNSON: Pretty much, yeah. There  
7 would be -- yeah. We'll get into the details of  
8 the tests a little bit later, but, yeah, in  
9 general. And it really focuses again, the scope  
10 is really ducts and unconditioned spaces in this  
11 particular case.

12 MR. TRIMBERGER: The scope is ducts  
13 and --

14 MR. JOHNSON: The scope of the air  
15 distribution system requirement would be for ducts  
16 and unconditioned spaces. So it would not require  
17 an all duct installation, just the ones that are  
18 in unconditioned spaces.

19 MR. PENNINGTON: Let me see if I could  
20 add --

21 MR. TRIMBERGER: Just to 90 percent.

22 MR. JOHNSON: Yeah, well, --

23 MR. PENNINGTON: Excuse me, Mr. Chair.  
24 Let me see if I can add to that answer. There is  
25 separate work that's going on to evaluate the cost

1 effectiveness and appropriateness of extending the  
2 current compliance option for duct sealing in  
3 basically light commercial buildings where the  
4 ducts are in unconditioned space to a prescriptive  
5 requirement for those buildings, so that it would  
6 be the basis of the standard design for those  
7 buildings.

8 So that is being separately looked at.  
9 Actually, I think the language in this report  
10 would be consistent with that current option being  
11 changed to a prescriptive requirement.

12 But actually most of the cost  
13 effectiveness analysis is being done in a separate  
14 report.

15 MR. TRIMBERGER: Yeah, my concern, if  
16 you were looking at it as a duct testing, with a  
17 HERS rater, that's something that is being done  
18 kind of sparingly on a residential basis. I bet  
19 there's probably 1000 residential for every  
20 commercial basis, commercial project going on  
21 that's doing that.

22 It's not something that the industry has  
23 embraced yet.

24 MR. ALCORN: Ken, did you have a  
25 comment?

1           MR. GILLESPIE: Yeah, I actually have a  
2       concern about one of the suppositions behind this  
3       as the contractors are already required to do this  
4       work.

5           I think the reason why commissioning has  
6       found a place in the building industry is because  
7       dollars aren't provided to do the quality of the  
8       work. And to make the assumption that contractors  
9       are already doing this work, I think, is missing  
10      the point.

11          I really do think one of the problems  
12      we're seeing is just cost competitiveness; you  
13      squeeze them to the point where they start  
14      dropping certain tasks. And one of those tasks is  
15      doing that end of the game testing.

16          So I would question the assumption that  
17      this is currently including contractor rates. I  
18      think you're going to have to take into account  
19      that additional fees are going to have to be  
20      allotted to do this work.

21          It's a good idea, but the whole idea is  
22      to bring quality back into the building process.  
23      And I don't think owners have fully appreciated  
24      the cost competitiveness and what it's done to the  
25      product that they receive.

1 I have a number of wordsmithing  
2 comments, but I don't know if this is the time and  
3 place to do that.

4 MR. PENNINGTON: I think we're actually  
5 going to go into the details of this today, so  
6 maybe you can bring up your comments when we're  
7 talking about that topic.

8 Bob.

9 MR. BURT: Bob Burt, Insulation  
10 Contractors. Let me make sure that I understand  
11 your fundamental concept. Basically when the  
12 owner accepts a building there's always to some  
13 extent a process wherein he satisfies himself that  
14 the contract has been complied with.

15 Now what you're saying is that we want a  
16 third party to verify not just the contract  
17 compliance, but code compliance?

18 MR. JOHNSON: Let me clarify that.  
19 We're not actually saying a third party does that.  
20 The person who would be verifying this would be  
21 one of the agents of the owner that's been  
22 performing on the project.

23 The agent could be -- essentially agents  
24 are defined in the Business and Professions Code;  
25 in the case of a mechanical system it would be a



1 mechanical engineer; I believe the architect can  
2 also do that; or licensee -- mechanical. And in  
3 some cases there are some exceptions to that.

4 But in general, those are the folks that  
5 would be certifying it. And we would expect, for  
6 example, if I'm a mechanical contractor and I  
7 install a system, that I would then sign that  
8 certificate of acceptance. And that certificate  
9 then would state that my work met these test  
10 requirements.

11 MR. BURT: So in effect what you're  
12 saying is that this need not be a separate third  
13 party, but the process can take part as a part of  
14 the owner's normal process of acceptance of  
15 saying, okay, I agree, you, the contractor, built  
16 the thing in accordance with my contract.

17 And the party who does the signature can  
18 be part of that normal process, but is required to  
19 be a professional engineer?

20 MR. JOHNSON: That's correct,  
21 professional engineer or someone who's --

22 MR. BURT: Equivalent certified --

23 MR. JOHNSON: Correct.

24 MR. ALCORN: Ahmed.

25 MR. AHMED: Jeff, could you explain a

1 little bit about this commissioning that's going  
2 on? I'm a little confused. You said this will be  
3 part of the commissioning, and at the same time  
4 this will require -- it'll be incorporated into  
5 the standards, you know, that's why I'm a little  
6 confused.

7 MR. JOHNSON: Okay. Yeah, commissioning  
8 is a process that's sort of a cradle-to-grave  
9 process in terms of verifying not only that the  
10 design, a lot of the design details are integrated  
11 within the design process, but that also when  
12 things get out to the field that that integration  
13 occurs. And ultimately the building operations  
14 team is trained to operate the systems according  
15 to the design intent of the building.

16 And there's a lot of pieces in between.  
17 In that process there are a couple steps. Clearly  
18 verification that the measure's installed. Before  
19 the measure is tested you need to make sure that  
20 you've got sensors calibrated; that there's wells  
21 available for doing temperature measurement to  
22 calibrate those devices, those kinds of things.

23 And finally, there's some functional  
24 tests that occur that make sure that the equipment  
25 works properly.

1           And essentially those are steps in the  
2           commissioning process. Those steps we've  
3           documented here and are calling acceptance  
4           testing.

5           MR. GILLESPIE: I could try to qualify  
6           what was just said. I think this process is  
7           designed to complement what a comprehensive  
8           commissioning process would entail, so the two  
9           would fit together.

10          Not to supplement or -- I mean they  
11          would --

12          MR. AHMED: So it would be a subset, in  
13          other words the commissioning -- I mean will there  
14          be an agency or an authority on who is going to  
15          oversee the commissioning? And this part would be  
16          a part of that, subset of that?

17          MR. JOHNSON: This proposal does not  
18          propose to require commissioning, so if an owner  
19          chooses to do commissioning this would not add  
20          additional work to that owner. So that owner  
21          would not have to pay additional -- this would be  
22          a normal part of doing business if you were going  
23          to hire a commissioning agent to commission your  
24          building.

25          If you didn't hire a commissioning agent

1 this would be something that you'd need to do.

2 So, that's sort of a -- but the proposal does not  
3 require commissioning.

4 Some codes have done that, and there's  
5 some work to try and build within the California  
6 Commissioning Collaborative to try and build a  
7 starter commissioning function in the State of  
8 California, but those are not a part of this  
9 proposal.

10 MR. ALCORN: Any more questions or  
11 comments on this part of the presentation?

12 MR. JOHNSON: I'd like to get some more  
13 feedback on Ken's comment earlier, if we could.  
14 Just, I think the idea that contractors don't  
15 normally do this.

16 Part of the feedback that we received  
17 in, well, the original proposal was to look at  
18 third-party field verification where you brought  
19 an independent third party in to do this. And  
20 part of the reason that that was rejected was that  
21 it seemed to be adding additional layer of players  
22 to fix a system that we thought was working okay  
23 in some cases, but knew wasn't working okay in a  
24 lot of cases.

25 I mean there's a lot of evidence that

1 systems and the controls, particularly the ones  
2 we've listed here, are not working. There's also  
3 some that work pretty well.

4 And so some contractors are getting it  
5 right, and some aren't. Or some building  
6 processes are getting it right and some aren't.

7 And so the idea was how do you develop a  
8 system that rewards those who are doing it right,  
9 and requires those who don't to at least hopefully  
10 think about it and learn how to do it right. And  
11 if they decide to sign the piece of paper and do  
12 it wrong anyway, well, that's their choice.

13 But hopefully that will cause them to  
14 pause a little bit and think about how to change  
15 their process. So, does anyone have -- I'd like  
16 to get some feedback on do people agree with that?  
17 Do you think that things are -- contractors are  
18 doing really bad work all the time, or some are  
19 doing okay work, or -- I don't know --

20 MR. BURT: The feedback that I have from  
21 the industry which is not very large, is that  
22 there are cases where there's a lengthy  
23 association between a project developer and a  
24 contractor wherein the project developer is quite  
25 confident that if he has problems in the building

1 after it's occupied, the contractor will take care  
2 of it, because that contractor and he had a  
3 lengthy relation.

4 And I think that's the type of case  
5 where a detailed contract compliance action  
6 probably would not be normal in acceptance of the  
7 building.

8 That's the only thing from the feedback  
9 that I have, which I'll state categorically is not  
10 very large. That it would not be normal for the  
11 owner to have at least some meticulous effort to  
12 find out whether the contractor complied with.  
13 That puts something of a burden on the plan check,  
14 but at least it would, normal process where this  
15 lengthy relation between me, the developer, and  
16 you, the contractor, is not the case.

17 I can't really believe that many people  
18 are going to occupy a building without some effort  
19 to make sure that the contract has been complied  
20 with.

21 They may also have had their own  
22 building inspectors, which would shorten the  
23 process. But, again, it's my observation again  
24 that hiring a building inspector to observe  
25 construction is not the common process.

1           MR. TRIMBERGER: I think I would concur  
2           that this is not the norm at all. Perhaps it is  
3           for larger systems, you know, mid rise  
4           construction, schools, hospitals, maybe grocery  
5           stores will get into this kind of thing.

6           But the majority of work that goes on,  
7           the retails, the small commercial, light  
8           commercial, I don't know how much of this goes on.  
9           Probably not much. And I think when it does go  
10          on, either large or small, it is a function of the  
11          owner's contract to say, yes, I'll pay you when  
12          it's done and when it's working.

13          So the relationship is owner to  
14          contractor, and there's a fiscal relationship and  
15          responsibility. So if we're trying to add to that  
16          responsibility by saying, okay, now you got to  
17          sign this piece of paper and check the boxes, I  
18          think for the most part that, you know, checking  
19          the boxes isn't going to have as much emphasis as  
20          the fiscal part.

21          Where it kind of, the performance of the  
22          system is more a matter for the owner and the  
23          contractor. And so it's hard for the state or for  
24          a regulator or for building departments to say,  
25          okay, check the boxes. I don't think that's going

1 to carry as much weight or importance.

2 MR. JOHNSON: One of the things we sort  
3 of wrestled with on this one, in some sense, you  
4 know, I think that's probably typically the case.  
5 But, I mean you probably wouldn't say a similar  
6 thing about structural or fire systems.

7 And while the code may not have the  
8 same -- the standards may not have the same impact  
9 in terms of health and safety, there's clearly an  
10 energy impact that's intended by the code. And  
11 how many owners are sophisticated enough to a) ask  
12 for right questions to say are these systems  
13 working properly from an energy perspective; and  
14 then also because the intent of the code is to  
15 reduce energy consumption which does have an  
16 impact on the state, you know, there's a reason to  
17 do that that goes beyond just a we think it's a  
18 cool thing to do.

19 And so that's partly what we're  
20 struggling with is that there is evidence in some  
21 cases that people do pay attention to this. Some  
22 of the ones you've noted, and I think some of the  
23 other, some large contractors as well, that want  
24 to do this a normal part of business, it clearly  
25 is within the intent of the standard, it's not to



1 just put these things in, but have them work the  
2 way they're supposed to work so they deliver  
3 savings.

4 And we also recognize that owners are  
5 probably not sophisticated enough to ask that  
6 these things -- ask the right questions, or make  
7 sure these tests are in their contracts, to make  
8 sure these systems are working right.

9 And so it's part of what this is trying  
10 to capture, is those issues.

11 MR. ALCORN: Tony.

12 MR. PIERCE: Tony Pierce with Southern  
13 California Edison. Jeff, I was listening to this  
14 on the acceptance testing, the certificate of  
15 acceptance, and what I hear and I guess they  
16 counter to what Tom is saying, is on the  
17 institutional projects where, in my experience,  
18 these requirements are part of the documents. And  
19 oftentimes, I think, as Ken said, they're not  
20 done, they're not completed.

21 I kind of hear the certificate of  
22 acceptance as being for the contractors with a  
23 conscience that cause for pause.

24 (Laughter.)

25 MR. PIERCE: Am I reading -- did I

1 really test the ducts, or am I just going to sign  
2 it off? I'm not sure how that -- this is more of  
3 a comment than a question, I guess, but I'm not  
4 sure how that encourages, say, the contractor to  
5 do the right thing over, say, when he submits his  
6 final invoice. And I guess the fiscal motivation,  
7 I think Tom was referring to.

8 And then that one-year warranty that  
9 typically comes with completion of that job and  
10 acceptance of that final payment. And I think  
11 this ties into the measures that you're looking  
12 at, at least in the initial package. And as has  
13 been pointed out, most of them are controls  
14 measures.

15 In my experience a lot of these controls  
16 issues crop up well after the one-year warranty.  
17 So I guess my comment is then what more weight  
18 does the certificate of acceptance have than a  
19 contractor who's waiting out a warranty period for  
20 problems that are once determined, difficult to  
21 assess who's the responsible party.

22 I mean is a control out of calibration;  
23 was it never set up properly; you know, are the  
24 sensors correct for the controller, all those  
25 issues. We'll probably get into that in more

1 detail later.

2 MR. JOHNSON: That's great. Well, a  
3 couple things thinking along and developing, I  
4 guess. One was we realized that the persistence  
5 of these measures varies. In terms of, you know,  
6 if you seal the ducts properly when you do the  
7 installation chances are that will last you for  
8 awhile. Till somebody either tears them up or  
9 something else happens up there.

10 Others, it's going to be -- it may vary.  
11 And so we sort of say, well, gee, we know this  
12 isn't going to guarantee that the economizer works  
13 for the 15-year life of the equipment by doing  
14 this. Admit that.

15 On the other hand we'll also say that in  
16 many cases problems with economizers just have to  
17 do with just not putting two wires together. On a  
18 field-installed unit, you actually have to -- or  
19 on the unit, not -- many times the distributor  
20 actually installs the economizer, and they'll  
21 install, physically put it on the unit. For a  
22 field installer to properly hook it up, they have  
23 to actually disassemble the unit, connect the  
24 wires and put it back on again.

25 Now, you know, with a contractor who has

1       trained their force in its proper oversight,  
2       that's going to happen. In other cases that won't  
3       happen. So, one of the things we wanted to make  
4       sure was a) we established a set of requirements.  
5       This is what we expected to do, and if we're going  
6       to put that in the code, there's a piece of paper  
7       that says, here's what the expectations are.

8               And number two is to make sure that the  
9       equipment, at least as it comes out of the job and  
10      the first installation occurs, is working the way  
11      it's supposed to work. Now where it goes from  
12      there is a matter of maintenance practices; it's a  
13      matter of the robustness of the system, you know,  
14      the design. A lot of issues that deal with that.

15             But at least coming off the site what  
16      we're hoping is within that warranty period this  
17      stuff's nailed down and working properly so that  
18      if someone wants to maintain it over its life in  
19      the proper way, they're starting with a system  
20      that's working properly. And those expectations  
21      are laid out.

22             And I guess the final thing is that, you  
23      know, it creates a paper trail that says, you  
24      know, yes, we understood these expectations. We  
25      signed that we met these expectations. And at

1       some future date I think it gives us an  
2       opportunity to go inspect these systems, do some  
3       follow up. And at some point in time decide if  
4       the system is really getting what we want.

5               And if not, it may provide evidence that  
6       third-party field verification is necessary at  
7       some point in time to make sure these things were  
8       done properly.

9               But at this point in time we're saying  
10       let's take this first step; let's nail down the  
11       expectations; let's get this stuff working as it  
12       was intended to at the end of the construction  
13       period. And let's create a paper trail that  
14       documents that.

15              And from that point we can figure out if  
16       things are working or not, and we can go from  
17       there.

18              MR. ELEY: I'm Charles Eley with Eley  
19       Associates. Your proposed code changes to section  
20       10-103, and this would affect the low rise  
21       residential and nonresidential buildings.

22              So, the certificate of acceptance would  
23       become a requirement for all building types, not  
24       just nonresidential? That's your intention, I  
25       assume, right? And so we'd have to deal with this

1 not just for nonresidential, but for residential  
2 buildings, as well?

3 MR. JOHNSON: Actually if you look at  
4 10-103(b) (1) which is on page 9 of the project  
5 report, that's called part four. Part four  
6 actually -- part three defines what the  
7 certificate of acceptance is. And part four is  
8 where it actually states its use.

9 And so what we intended was this would  
10 apply only to nonresidential buildings.

11 MR. ELEY: Okay.

12 MR. PIERCE: Jeff, clarification on the  
13 proposed responsible parties who could sign the  
14 certificate of acceptance, you mentioned that, you  
15 know, PE, some type of new certification through  
16 CABEC or some other thing, would principals of the  
17 contractor be eligible in your proposal?

18 MR. JOHNSON: Yeah, the final proposal  
19 we're putting forth is that it's -- and, in fact,  
20 it's in the -- I'll find the exact -- on page 9 at  
21 the top, the signer shall be eligible under  
22 division 3 of the Business and Professions Code to  
23 sign such documents.

24 Now, this is the same text that's used  
25 for the individuals who can sign the certificate

1 of compliance. And essentially division three  
2 has, there's three categories, either the  
3 architect or the licensed engineer, you're a  
4 contractor who's bid and is installing the work.  
5 So the principal, for example, could do it.

6 And there's an other category which is  
7 sort of a catch-all that doesn't get used a lot is  
8 my understanding.

9 So, it's kind of like on the residential  
10 side a homeowner, owner/builder could do it, for  
11 example. But on the commercial side I'm not sure  
12 what parallels exist -- in here, so it would  
13 really be, yeah, so the principal of a contracting  
14 firm who did the installation would be eligible to  
15 sign that.

16 MR. PIERCE: So a contractor wouldn't  
17 necessarily have to go out and get any other  
18 certifications?

19 MR. JOHNSON: No. No, there'd be no  
20 other certifications required.

21 MR. ALCORN: John.

22 MR. OTTO: Yes, John Otto, General  
23 Services. In the previous discussion scenarios  
24 you alluded to a paper trail. Did you give any  
25 thought to -- the implication was that another

1 agenda item was to have a database for future  
2 verifications.

3 But I see this only in kind of an  
4 idealistic situation for new construction. And  
5 once the paper trail that you can lobby to is held  
6 up by say an enforcement agency, where is your  
7 paper trail there?

8 For example, where's the paper trail  
9 with an owner who sells the property? Even in the  
10 bureaucratic archives of the code enforcement  
11 agency, those paper trails will disappear.

12 And much construction isn't regulated by  
13 them. Is OSHPD going to keep a scenario, a paper  
14 trail? Is DSA going to keep all the schools  
15 records paper trail for school districts? Are you  
16 going to hit their facilities people, in our case,  
17 for state-owned facilities, are you going to  
18 create another agency within the CEC, or within  
19 some other agency to keep this paper trail? Where  
20 was your workshop dialogue on that?

21 MR. JOHNSON: I think first of all the  
22 current certificate of compliance is actually one  
23 of the required documents to be provided to the  
24 building owner under section 10 of the standards.  
25 And so along with operating and maintenance



1 information and installation certificates they're  
2 required to provide a certificate of compliance.

3 We intended this to be another document  
4 provided to the owner. That is all within the  
5 scope of the enforcement process, as we understand  
6 it.

7 As you get outside of that scope and  
8 start looking at recording things with deeds or  
9 other documentation areas, those tend to fall  
10 outside of the scope of the standards, and get  
11 more difficult to implement through the standards  
12 process.

13 MR. PENNINGTON: I would just add to  
14 that I think that's exactly right in terms of  
15 where the Energy Commission thinks it can have  
16 influence through our regulations.

17 But you mention the possibility of other  
18 authorities requiring this documentation as part  
19 of the record for the building. And I think that  
20 makes a lot of sense.

21 In the past CalOSHA has, for example,  
22 referred to the ventilation requirements that were  
23 established in Title 24, part 6. And so that's  
24 part of the obligation for operating the building  
25 now, is that those requirements are -- not only

1 the building is designed to meet those  
2 requirements, but the building is operated to meet  
3 those requirements, as well.

4 Other agencies, the ones you mentioned  
5 would be excellent candidates for considering, you  
6 know, should they be expecting, you know, but  
7 basically their owners or, you know, have a  
8 relationship to the owners for those buildings.  
9 And, you know, it would make sense for there to be  
10 an expectation that these documents be part of the  
11 record.

12 And perhaps DSA, all the organizations  
13 that you mentioned would want to consider that.  
14 Maybe we could work with those organizations.

15 MR. OTTO: My skepticism is if I picked  
16 up the telephone today and called UC Davis Med  
17 Center, or I called Sutter Health or I called Elk  
18 Grove Unified School District and asked them for  
19 their Title 24 compliance information on the most  
20 recently completed project, it would be six months  
21 before they could find it, if at all.

22 Just an editorial comment.

23 MR. JOHNSON: Yeah, that's actually --  
24 this is a proposal in the State of California.  
25 There's some thoughts about this, you know, with

1 using these voluntary programs in other ways that  
2 I think might be able to give some more weight to  
3 that. And I think even looking at some of the  
4 statewide utility programs, things like that,  
5 there may be other vehicles we can use to put an  
6 exclamation point on this particular piece, and  
7 where it fits within that scheme.

8 And I think this is one mechanism we  
9 have as the standards. You can't solve all the  
10 problems, but it might be able to create enough of  
11 a basis for doing some other things with. And I  
12 think the piece that Bill pointed out under the  
13 health and safety code is a great example, where  
14 they reference Title 24 as being the level of  
15 ventilation that's required to be provided to a  
16 space, at least as per the design at that point in  
17 time.

18 And then they require that an employer  
19 provide records, make records available to any  
20 employee who requests that information, within 24  
21 hours, on whether the system's actually delivering  
22 that.

23 And the idea was that, in fact in the  
24 current standards it says you're to do this  
25 completion and balancing test and produce that

1 record day one, so that building owner has a copy  
2 of that record.

3 Now, I don't know how often this is  
4 used, but at least what's happened is you've set  
5 up that framework. Now how that framework's  
6 implemented outside of the building inspection  
7 process, or outside of the standards process is, I  
8 think, really up to the other agencies, up to  
9 volunteer groups, up to however other way you  
10 can -- we can leverage to get that to work.

11 And those are, you know, at least start  
12 to create that platform for that to happen. But  
13 I'm not sure we can completely follow through and  
14 do -- we can't do all of that within the  
15 standards.

16 MR. PENNINGTON: Another thing I would  
17 mention that Jeff alluded to is that, you know,  
18 one of the reasons why the Commission set up a  
19 schedule in which the standards are adopted well  
20 in advance of the effective date is so that we can  
21 work with voluntary programs to try to get the  
22 requirements, get some experience with the  
23 requirements before they go into effect.

24 And specifically to work with utility,  
25 public goods charge, funded programs to get people

1 trained on the requirements, and to have an assist  
2 from those utility programs, trying to get the  
3 requirements implemented.

4 That's sort of part of our design for  
5 the strategy for the '05 standards.

6 MR. JOHNSON: I can give you another  
7 example. I know the State of New York has  
8 instituted a thing recently where the Building  
9 Performance Institute is to certify contractors as  
10 having a certain level of competence for them to  
11 participate in their Energy Star homes program.

12 This is an Institute with both the HERS  
13 raters in New York and also the builders. And  
14 they approached New York State Energy Research and  
15 Development Authority to start this up.

16 The Building Performance Institute is  
17 looking at establishing sort of a more of a larger  
18 scale certification process. This fits well with  
19 this, for example, could become a piece of their  
20 contractor certification process. Is that a  
21 contractor be certified in these areas as being  
22 able to perform these tests.

23 So, an owner could stipulate that to  
24 work on the project you'd have to be a BPI  
25 certified contractor. That could be stipulation

1 of a voluntary program.

2 So, it can go outside of the standard  
3 and have other meaning. And I think that's going  
4 to be left up to some creative people who design  
5 the programs that run businesses that deal with  
6 the new construction process; or agencies who  
7 manage large buildings is another way to do it.

8 So hopefully this could become a vehicle  
9 that could be leveraged to do other things beyond  
10 just creating this piece of paper that says here's  
11 your certificate of acceptance.

12 MR. ALCORN: Ahmed.

13 MR. AHMED: I was just going to suggest  
14 that perhaps the certificate of compliance could  
15 be a simple one-page thing that may have to  
16 display in the building. That might help.

17 MR. JOHNSON: There you go, building  
18 lobby display.

19 (Laughter.)

20 MR. AHMED: Because, as you know, in  
21 most large building construction, control  
22 diagrams, et cetera, have to be displayed and say  
23 requirement by mechanical engineers that they be  
24 displayed in the equipment rooms. So maybe that  
25 could be a requirement for the certificate of

1 acceptance.

2 And one other suggestion I had was maybe  
3 we could, as Tony was pointing out, that most of  
4 the problems with the controls occur after the  
5 construction a few months or years later. Perhaps  
6 if this testing, acceptance testing is done a  
7 couple of months later then perhaps the contractor  
8 will do a better job because he knows he doesn't  
9 have to go back and fix things.

10 MR. JOHNSON: Um-hum. That's a good  
11 point. And, in fact, right now I believe they're  
12 specific about the certificate of compliance being  
13 on the plans and specifications. So at some point  
14 saying display it in the mechanical room or  
15 something like that.

16 MR. ALCORN: Okay, we're about five  
17 minutes behind our agenda. If there are no more  
18 questions or comments, maybe we could move on to  
19 the test criteria presentation.

20 MR. JOHNSON: Okay. Great. I'm going  
21 to do a quick overview of this test criteria. And  
22 then I'm going to have Larry talk about a specific  
23 example, Larry Luskay from PECI, go through some  
24 of the more detailed stuff.

25 So, in terms of the acceptance

1 requirements, just to provide a little more detail  
2 on that, we're specifically talking about a couple  
3 things. One is acceptance means plans are  
4 acceptable. And plans acceptable means that we  
5 need to properly document things like sensor  
6 locations, control sequences, those kinds of  
7 issues.

8           There's a lot of -- this level of  
9 documentation varies pretty wildly. But to  
10 properly implement the measures that we're  
11 requiring acceptance, certain things need to be  
12 documented.

13           And so the acceptance requirements would  
14 include verifying that the plans and  
15 specifications have the proper information on  
16 them.

17           Secondly, there'd need to be an  
18 installation verification, make sure the  
19 installation's there, sensors are calibrated,  
20 things like that. And functional tests performed.  
21 And corrections made. It's one thing to perform  
22 the test, it's another thing to make sure that the  
23 tests are acceptable.

24           And so we intend that a part of the  
25 acceptance requirements would be to make those



1 corrections.

2           Interesting to note, many of these  
3 corrections may not be something an owner would  
4 notice, because they may not affect the comfort of  
5 the space, the performance of the system as far as  
6 the owner is concerned. But may have a big impact  
7 on the energy side.

8           There are also the installation  
9 certificates, O&M materials, the acceptance. The  
10 contractor would be required to make sure that  
11 those are completed and transferred to the owner  
12 and finalized.

13           And then they would -- sign the  
14 certificate and submit it to the enforcement  
15 agency. And when the enforcement agency received  
16 that, that, you know, would basically be, okay,  
17 the energy -- this portion of the energy pieces  
18 are taken care of, and it's time to move on to  
19 finalizing whatever else is necessary to get to  
20 issue an occupancy permit.

21           So that's really what the acceptance  
22 requirements are; and that certificate of  
23 acceptance will cover in a little more detail.

24           In terms of the equipment we're  
25 proposing to cover under this, there's a couple

1 different ways we've broken this up. One is what  
2 mandatory equipment's required to be tested.

3 If you look at section 121(f) of the  
4 standards, there is something called completion  
5 and balancing requirements. Those were  
6 established back in '92.

7 What we're proposing to do is  
8 essentially, and if you turn to page 10 of the  
9 report, acceptance requirements for nonresidential  
10 buildings, there's a standards proposal there for  
11 outside air acceptance. And that would basically  
12 replace the existing section 121(f).

13 And, again, what we're saying is that a  
14 space shall be certified and the certificate of  
15 acceptance shall be submitted. And it certifies  
16 that the plans met the requirements of part six.  
17 And 121(a)(2), which is the ventilation  
18 requirement section. And they also certified that  
19 the measured outside air is within 10 percent of  
20 the minimum ventilation rate specified in the  
21 plans and specifications.

22 Now, currently one of the options that  
23 you have under section 121(f) is to use the AABC  
24 or NEVS procedure. Essentially they provide for  
25 the same tolerances, about a 10 percent

1 difference. So if you're doing outside air  
2 acceptance under the current standard, this  
3 doesn't require anything additional in terms of  
4 the tolerance is the same, but it does consolidate  
5 the requirements in a little different manner.

6 So, that's the proposal for dealing with  
7 outside air under 121(f).

8 Are there any questions or comments on  
9 that? Thought it was pretty straightforward, just  
10 pulling stuff that's in there and putting it under  
11 the umbrella of this new process.

12 Under section 122(a) through (g), let me  
13 back up a little bit. If you look at the way the  
14 standards are set up, section 120 is essentially  
15 the mandatory requirements. And so that's really  
16 the section we're in right now.

17 122 would have an (h) added, and  
18 essentially that would be a space conditioning  
19 controls acceptance requirement. Again, the  
20 plans, installation certificates and operating and  
21 maintenance information is there.

22 The requirement the system meets the  
23 outdoor air requirements. And I think 121(a)(1),  
24 I believe, has to do with being able to provide  
25 outside air during the occupied period. So if

1 someone comes in and needs to initiate an override  
2 to be able to get the system to turn on on a  
3 weekend or an off-hour period, they'd be able to  
4 meet that.

5 And then finally (h) (3) would then be  
6 the certification of the controls requirements.  
7 And if you walk through those requirements, what  
8 they really boil down to is two general areas. I  
9 guess one has to do with the setup and setback  
10 controls. So it would -- so I'd have the zone  
11 thermostat controls are installed and operating,  
12 and that there's no set-point, or that the proper  
13 dead-bands are set.

14 That hotel/motel guest room and high  
15 rise residential dwelling thermostats are  
16 installed. And the setbacks are set properly.  
17 That if there's a heat pump there's heat pump  
18 controls installed with the heat pump.  
19 Surprising, but it doesn't always happen.

20 Shut-off and reset controls for space  
21 conditioning systems. And this has to do with the  
22 automatic time control devices, making sure  
23 they're installed and operating properly.

24 Something as simple as not using a  
25 residential thermostat on a commercial system. Or

1 if you're using an economizer you should have a  
2 two-stage thermostat. Those kinds of issues would  
3 be caught here. Those are not currently being  
4 caught all the time now. We're getting a lot of  
5 field evidence that those are problems out there.  
6 And so this would help catch that.

7 The other area we'd be looking at is  
8 dampers. And then finally isolation area devices.  
9 Isolation area devices are essentially devices  
10 that are required to be able to separate spaces of  
11 buildings and have them operate independently from  
12 one another.

13 It's been a requirement in the code  
14 since 1992. And it would just basically say, you  
15 know, the requirement would say that the  
16 contractor would have to certify that they  
17 actually implemented that requirement.

18 So those are essentially the areas that  
19 this sections 122(a) through (g) would be covering  
20 under this proposed acceptance criteria.

21 Yes?

22 MR. ALCORN: You need to come up,  
23 Martha, please.

24 MS. BROOK: Are there any sensor levels  
25 functional tests required?

1           MR. JOHNSON: We'll get into that in the  
2 actual testing, but, yeah, part of the steps of  
3 testing there are pieces that are covered.

4           Larry, do you want to add, at this  
5 point?

6           MR. LUSKAY: I'm not sure exactly what  
7 you mean.

8           MS. BROOK: Do you actually test to see  
9 if a sensor is working?

10          MR. LUSKAY: Calibration? Yeah, that  
11 would definitely be part of it.

12          MR. ALCORN: Tom has a comment, I  
13 believe.

14          MR. TRIMBERGER: Tom Trimberger of  
15 CALBO. Couple of questions. What are the  
16 isolation devices you were talking about, can you  
17 expand on that?

18                 And I don't see in this booklet where  
19 you've got 122(a) through (g). Is that all in  
20 this document?

21          MR. JOHNSON: Yeah, on page 11 the  
22 actual code text. It's called part two. We added  
23 a new section 122(h) as follows. And the last  
24 (h) (3) is certifies that the space conditioning  
25 controls meet the requirements of 122(a) through

1 122(g) .

2 MR. TRIMBERGER: And those are existing  
3 (a) through (g)?

4 MR. JOHNSON: Correct.

5 MR. TRIMBERGER: Okay.

6 MR. JOHNSON: They're existing  
7 requirements. Isolation area devices, it's  
8 implemented in a couple ways. One is a floor-by-  
9 floor system in a larger building where you can  
10 turn one floor on at a time. There's a fan.

11 So basically being able to operate one  
12 floor of the building at a time is one way to do  
13 it, up to about a 25,000 square foot floor plan.

14 Beyond that, that's one way to do it.  
15 In other cases it can be done through VAV system  
16 just by allowing the boxes to go 100 percent  
17 closed. So if you turn off spaces by shutting the  
18 boxes down all the way.

19 Now, that's something that's not  
20 normally done in the course of operating a  
21 building, or designing a control system, yet it's  
22 something that's in the standard. And so it's  
23 just a matter of putting -- making sure that  
24 that's implemented.

25 In package equipment it's pretty much by

1 default. The system operates, you know, it  
2 operates independently. So, this is primarily  
3 intended for larger systems. And it's just  
4 require the designer and the contractor to install  
5 and make sure that the system is able to operate  
6 in chunks.

7 And it really comes into play during  
8 after hours if you've got one tenant in a building  
9 that works late, or you've got different operating  
10 schedules, say for a retail portion versus an  
11 office portion. It allows the building to operate  
12 those pieces independently without having to turn  
13 the whole system on.

14 MR. ELEY: That requirement's been there  
15 for awhile, but this is a new verification of that  
16 requirement?

17 MR. JOHNSON: Yes, that's correct.  
18 Yeah, we don't have a lot of -- we've got some  
19 reports that this is not consistently implemented.  
20 Or that they can't find any buildings that  
21 actually really do this.

22 MR. TRIMBERGER: Have you looked at all  
23 of --

24 MR. ALCORN: We have one more --

25 MR. JOHNSON: This is basically covering



1       those pieces, so --

2               MR. TRIMBERGER:  Have you looked at all  
3       about, you know, for every time you do a new  
4       system you do several alterations to existing  
5       systems.  So if I'm a contractor bidding on doing  
6       some duct work changes, move a thermostat or two  
7       on an existing system, am I going to have to  
8       verify all the existing controls are working and  
9       in place?

10              It gets a little messier when you look  
11      at existing systems.  Have you looked at that yet?

12              MR. JOHNSON:  Well, we wish, but I don't  
13      think the standards require they do that now.  So,  
14      I think the standards are pretty clear on the HVAC  
15      equipment, is that you would need to do this on  
16      the stuff that you worked, that you touched that  
17      you change.  But the existing systems you do not  
18      have to bring up to speed.

19              Because that's the way the current  
20      additions and alterations requirements are written  
21      in the standards.  And this would basically would  
22      not modify those at all.

23              And lighting systems, if you did over 50  
24      percent of the -- replaced over 50 percent of the  
25      lights, then yes, this would be triggered.  But on

1 HVAC it's pretty -- the mechanical system is  
2 pretty much whatever you work on is what's  
3 required to be verified by the contractor. And  
4 the other stuff sort of falls outside that scope.

5 Although that would be an interesting  
6 thing to require.

7 MR. PENNINGTON: So basically these  
8 requirements would apply to the altered equipment?

9 MR. JOHNSON: Yes.

10 MR. OTTO: Back to my paper trail  
11 question. That if I read it correctly, though,  
12 you're putting the burden on the remodeling  
13 contractor to go back and verify data from the  
14 initial construction system that he's modifying?

15 MR. JOHNSON: No. What this would do is  
16 if I was a remodeling contractor and I came in and  
17 did an installation, say I replaced a thermostat.  
18 I would need to verify that that thermostat that I  
19 replaced, before I left the job, worked properly.

20 Now, I'm not sure they'd actually pull a  
21 permit for a thermostat replacement, but as an  
22 example, let's say they did. That basically  
23 they'd be required to make sure that thermostat  
24 met those requirements.

25 They would not have to verify that it

1 was working properly before they came in, nor  
2 would they have to check on the thermostats in the  
3 building.

4 MR. OTTO: I don't think that was my  
5 point. My point was, if I understood this  
6 correctly, if I modify the air distribution system  
7 I'd have to go back as part of the balancing and  
8 adjustment and recertifying of that system, and I  
9 would want that paper trail information of the  
10 previous acceptance to base my design information,  
11 again the lead being that may not be available.

12 So are you tasking a new remodel  
13 contractor with an obligation to verify the design  
14 of the existing?

15 MR. JOHNSON: The standards, right now,  
16 are -- there are going to be cases where there's  
17 going to need to be some judgment made.

18 In the case of a distribution system on  
19 the adding a section to a piece of existing duct  
20 work, and the previous system was not tested. And  
21 maybe let's say it was leaky. Would that  
22 contractor be required to go in and test to make  
23 sure that's there? That's when you call the hot  
24 line.

25 (Laughter.)

1 MR. JOHNSON: That's a good question.

2 I'm not sure if the intent is for them to have to  
3 go back through and reseal and test the entire  
4 system or not. I know in the current requirements  
5 that's, particularly the mechanical side, that's  
6 typically not the case.

7 Would it be a good idea? Probably.

8 From an energy standpoint, yeah. Can the  
9 standards require that? I don't know. I'm not  
10 sure that's in the --

11 MR. PENNINGTON: We actually struggled  
12 with that for additions for residential, and  
13 Charles worked on some of the writing of that.  
14 It's challenging to write that.

15 MR. JOHNSON: And I think getting back  
16 to the point of the acceptance test, if there was  
17 no certificate of acceptance, I mean it was done,  
18 you know, it was an older system versus having  
19 one, that would sure make it easier to make a  
20 decision. At least the contractor would know  
21 where they were starting from.

22 MR. ALCORN: Ken.

23 MR. GILLESPIE: The thing that jumps out  
24 at me when I listen to this is the reason you want  
25 to have controls is the dominant issue here is

1       that if we're not requiring the contractor to be  
2       concerned about interface with the existing  
3       equipment, we've lost to begin with.

4               That's where, I see this over and over  
5       and over again when you get multiple contractors  
6       coming on site, each doing a piece of the  
7       controls. And sooner or later you lose all  
8       continuity. No one knows what's there. And  
9       there's no reason that they actually have to be  
10      interfaced together.

11             So somewhere we've got to deal with this  
12      interface issue. I don't have any solutions, but  
13      I'm just saying that I see this as the pitfall of  
14      what we're doing.

15             MR. PENNINGTON: I basically see this as  
16      a starting point for doing a better job of this in  
17      the future, and, you know, this is sort of the  
18      bite that we can swallow at this time. So we're  
19      trying to set the stage here; we're trying to do a  
20      good job on, you know, --

21             MR. GILLESPIE: Testing is one thing,  
22      but interfacing with existing systems is where I'm  
23      dealing with here, and I think that's a different  
24      issue.

25             MR. JOHNSON: It's specifically three

1 models, repairs, alterations, things like that.

2 We haven't really focused on that yet, so you're  
3 right, we don't have a good answer for that --  
4 some of the meetings, so --

5 MR. ELEY: Well, I think there might be  
6 some cases with large constant volume systems  
7 where if you do major renovation or expansion it  
8 might trigger a requirement to rebalance the whole  
9 system. Because the existing systems may be  
10 getting less air than they really need, or more  
11 air than they need, something.

12 So, it's really tricky. The other part,  
13 too, is if this is limited just to the renovation,  
14 which I think is their scope, the person that's  
15 doing the certificate of acceptance may find that  
16 one of the systems upstream is not being  
17 controlled properly. And that chilled water is  
18 reaching the coil at the wrong temperature. Or  
19 that -- and what do they do then?

20 Do they compensate for that with their  
21 own adjustments? Or do they go upstream and  
22 correct that problem?

23 MR. ALCORN: Tony.

24 MR. PIERCE: Yeah, thanks. Tony Pierce  
25 from Southern California Edison. I'm curious

1 under your acceptance requirements you have plans  
2 must be properly documented showing location,  
3 sequences and everything.

4 In a bid project where, say, those  
5 sequences and control diagrams are not essentially  
6 compliant with the standards, how does the  
7 contractor, or how would you foresee that process  
8 directed by that occurring, if the contractor is  
9 the one that intends to sign the certificate of  
10 acceptance?

11 MR. JOHNSON: Well, yeah, that's a good  
12 point. I think what I really -- the certificate  
13 of acceptance actually functions in a little  
14 different way than the certificate of compliance.  
15 And that certificate of compliance is typically  
16 done, you know, prior to or on or about when the  
17 permit's applied for, and/or a bid package is  
18 going out.

19 Whereas the acceptance is typically done  
20 after that fact. So what they're going to look at  
21 in that particular case, whoever was awarded the  
22 contract will be required to produce -- their shop  
23 drawings should note all this information, should  
24 give appropriate guidance to the field installer  
25 to be able to catch these things. And put those

1 out.

2 In reviewing, for example, if a sensor  
3 is going to be in the sun or not, it's properly  
4 shielded. Those kinds of issues can be caught in  
5 the design because the particular design, it says,  
6 well, -- by the contractor, so a shop drawing --

7 MR. PIERCE: Well, I'm thinking that  
8 case, that bid project which is certainly  
9 prevalent or common, where the contractor is not  
10 going to play his hand. You know, so he gets the  
11 award and then to do the acceptance he's going to  
12 note these discrepancies. And submit change order  
13 requests essentially to say that this is what's  
14 required to bring the project up to code.

15 And then it's, I mean maybe offering the  
16 solution or the practical way that it would occur  
17 is the owner then goes back to the engineer of  
18 record or designer and says, you know, you  
19 provided me a set of documents that was to be per  
20 code and it isn't.

21 MR. JOHNSON: Interesting if that  
22 happens now, it usually happens once with a  
23 designer.

24 MR. PIERCE: I'm not suggesting that  
25 that's a --



1 MR. JOHNSON: No, I mean seriously, this  
2 would --

3 MR. PIERCE: -- a bad thing --

4 MR. JOHNSON: -- be a good way to  
5 catch -- yeah --

6 MR. PIERCE: -- it may be a good thing,  
7 but at least it happens up front --

8 MR. JOHNSON: I mean, that's what we  
9 intend.

10 MR. PIERCE: -- before the installation.  
11 But I can see another way of doing that in the bid  
12 project that the contractor responsible for the  
13 certificate of acceptance is going to then do this  
14 plan review. Maybe I'm reading that too  
15 literally.

16 MR. JOHNSON: Well, I think the -- you  
17 know, again that the intent there is to make sure  
18 this information is on the drawings; that those  
19 instructions are made available. And it's going  
20 to be hard to say which party is the one who's  
21 responsible to do that.

22 What we're making sure it's saying is  
23 that, you know, gee, whoever's responsible for  
24 this installation had reviewed the drawings. And  
25 either it was noted or it wasn't. And if it was

1       their own drawings, that they put it on there. If  
2       it wasn't, they can identify that discrepancy.

3               But it's sort of the way -- it's a tough  
4       thing to get at, I mean, you know, it's really  
5       important to get this stuff properly documented.  
6       I mean how can you test, for example, you're  
7       looking at, you know, a chilled water temperature  
8       that's not in the scope of these requirements, but  
9       if you were to test it, a chilled water loop, you  
10      actually have to go to the well installed so you  
11      can calibrate the sensor.

12             Okay, well, the drawings you have to  
13      note that an additional temperature well needs to  
14      be installed for doing the calibration. And many  
15      times that's not the case. And so it makes is  
16      really hard -- part of the commissioning process  
17      is to actually go through and install these wells  
18      to calibrate these sensors. And that adds a whole  
19      other level of complexity to that process.

20             And so at least getting that note in the  
21      drawings, the folks that provided for the  
22      projects, it's really important that's noted. And  
23      so those kinds of things are noted early on in the  
24      plans. Because that's really where everything  
25      kind of starts from there.

1           And so this was the best proposal we  
2       could come forward with at this point in time to  
3       try and catch that. I think -- some other ideas  
4       about how we could do that, or some suggestions on  
5       how to improve that, we'd welcome that.

6           MR. ALCORN: Go ahead, Tom.

7           MR. TRIMBERGER: Tom Trimberger with  
8       CALBO. A lot of this concerns me a great deal. A  
9       lot of this is putting -- this is similar to what  
10      we looked at with the HERS rating for residential.

11           Builders, commercial or residential,  
12      don't want to have a final approval, a final snag,  
13      or a final potential problem at the very end of  
14      their process. They don't want to have it at the  
15      beginning, right -- but at the end it's critical.

16           You know, you can start a project two  
17      days late. You sure can't end it two days late.  
18      I issue certificate of occupancy. There's a lot  
19      of pressure to meet that last date.

20           Most commercial projects go -- they  
21      basically don't meet their deadline and don't have  
22      everything done. And we give them a temporary  
23      certificate of occupancy, post a bond, things like  
24      that.

25           But they've got an advertised start date

1 for their retail store. They've got students  
2 coming in for class on Monday. They've got a  
3 contractor date that the contractor starts paying  
4 big bucks if they don't get in on a certain date.

5 There's municipal pressure; they want  
6 that retail store open; get those tax revenues  
7 going in. And these are big spenders and  
8 important people.

9 I think -- I'll give you my opinion. I  
10 think a lot of my opinion on why we don't see a  
11 lot of HERS verification going in is they don't  
12 want to have that last-minute approval, that last-  
13 minute potential snag. And for commercial it's a  
14 thousand times worse than residential. That last-  
15 minute snag.

16 You know, I thought it was almost  
17 humorous when the HERS was made available as an  
18 option for a commercial. Nobody in their right  
19 mind would use it.

20 So I think if industry had wind of this  
21 I think there would be a lot of opposition to  
22 this. It's a very scary thing. And it's in a  
23 very bad timing in the approval process.

24 MR. JOHNSON: Tom, one of the things  
25 that we actually did in phase one is, we, in our

1 survey we talked about this; we interviewed a  
2 number of code officials and others about this.  
3 And I think one of the things that we intend this  
4 to be is a part of issuing -- where we saw this as  
5 being is a hook on the final certificate of  
6 occupancy. We did not see this holding up a  
7 temporary CofO.

8 MR. TRIMBERGER: Right.

9 MR. JOHNSON: So we felt that the  
10 jurisdictions, at least the feedback we had was  
11 that the jurisdictions really used that authority  
12 on a temporary, you know, fairly judicious basis.  
13 It's really something that you don't do in the  
14 norm. It's done as the exception, but there are,  
15 as you stated, those exceptions are very important  
16 to do. We didn't see that as being supplanted  
17 that.

18 At the same time, it's the only hook  
19 we've got. Flat out. The only thing we've got  
20 within the inspection process, within in the whole  
21 enforcement process that can say, gosh, this stuff  
22 was working when we handed the keys over to you.  
23 There's just nothing else there.

24 And so, you know, in one sense our backs  
25 are up against the wall, but I also want to let

1       you know that I mean I think in terms of the work  
2       that we had done in the phase one report, it was  
3       pretty clear that the authority to issue a  
4       temporary, regardless of whether this was done or  
5       not, was recognized as well within the purview of  
6       the local official.

7               MR. TRIMBERGER: Right. Oh, I agree,  
8       I've got more purview than I can shake a stick at.

9               (Laughter.)

10              MR. TRIMBERGER: Have you talked to AIA  
11       about something, a recommendation for the  
12       standards specifications, or does this match  
13       standard specifications for commissioning?

14              MR. JOHNSON: In terms of the actual  
15       acceptance test requirements that are here?

16              MR. TRIMBERGER: As far as what they,  
17       you know, recommend putting in their standards  
18       specs for commissioning.

19              MR. JOHNSON: No, we have not. John.

20              MR. HOGAN: John Hogan, City of Seattle.  
21       We've had a commissioning requirement in our code  
22       for a number of years now. It's very key  
23       distinction between the temporary CofO and final  
24       CofO. Our commissioning threshold is the final  
25       CofO.

1           So, yeah, people want to get into their  
2           system, the HVAC may not be -- get into their  
3           space, the HVAC system may not be completely  
4           functioning, even when people get in there.

5           I think we all know sort of how this  
6           works. People get into a space and they say it's  
7           too cold or it's too hot, and so the final  
8           commissioning sort of works even when the people  
9           are getting into the space.

10          MR. PENNINGTON: Can I ask you a  
11          question about that?

12          MR. HOGAN: Sure.

13          MR. PENNINGTON: Would it be useful to  
14          be explicit about that?

15          MR. HOGAN: I think it would be useful  
16          because I think it would sort of bring down some  
17          of the concerns about things. If people thought  
18          it was a temporary CofO, or some jurisdictions  
19          were implementing it as temporary and some as  
20          final, I don't think you'd want to see that  
21          variation. I think it would be helpful to clarify  
22          that.

23          And the other comment, you asked about  
24          who would support this, or might not support this.  
25          Actually we had a lot of support from the HVAC

1 industry when we adopted this requirement. And I  
2 think a key issue in that is whether it's third  
3 party, or whether people can do some of their own  
4 performance verification.

5 But essentially people came in and said,  
6 you know, we're doing this; this is good practice.  
7 The people who aren't doing this are the ones that  
8 shouldn't be doing the jobs. So let's put this in  
9 and let's set a level playing field and have  
10 everybody do it right. And if people aren't doing  
11 it right, let's bring them up to what should be  
12 standard practice.

13 So, we had both the designers, the  
14 engineers, as well as the contractors, and the  
15 design/build firms, especially the larger design/  
16 build firms; that's part of the whole package they  
17 provide to people. You know, we'll design it,  
18 we'll build it, we'll maintain it for you. So  
19 they have this interest in making sure it works.

20 So we did have that support when we did  
21 our adoption.

22 MR. ELEY: John, do the Seattle  
23 requirements apply to all nonresidential  
24 buildings, or is there a scale or a size?

25 MR. HOGAN: They apply to all



1 nonresidential buildings. We make a distinction  
2 between simple systems such as you might see in a  
3 warehouse versus more complex systems. So  
4 different amounts of requirements.

5 MR. ELEY: Okay.

6 MR. ALCORN: Ken?

7 MR. GILLESPIE: I'll pass.

8 MR. ALCORN: I guess we're ready to move  
9 to the --

10 MR. JOHNSON: Yeah, at this point in  
11 time let's have Larry walk through an example of  
12 essentially what we're talking about in terms of  
13 acceptance requirement. And the example he's  
14 going to look at, he's going to go through is the  
15 outdoor air systems.

16 MR. LUSKAY: Larry Luskay with PEI.  
17 Basically the way that we laid out all the  
18 acceptance requirements were in three different  
19 steps.

20 Try and identify issues that would need  
21 to be identified and checked during plan review.  
22 Construction inspection, that was basically just  
23 making sure that the equipment is in place, that  
24 it's hooked up, that it is ready to go for actual  
25 functional testing. And then there would be the

1 actual equipment startup, which is where we would  
2 have our functional tests.

3 And the example that I want to walk  
4 through is the outdoor air, looking primarily at a  
5 variable air volume system in particular, because  
6 the constant volume system, we're not too  
7 concerned -- well, we're concerned obviously, but  
8 once it's fixed and running it's a constant  
9 volume. So your amount of outside air is not  
10 going to fluctuate.

11 The area where we were most concerned  
12 with was in a variable air volume system, in  
13 insuring that we always brought in the minimum  
14 required amount of outside air as your total  
15 supply air varied to meet varying loads within  
16 your space.

17 And in a plan review basically would  
18 just need to be checked to make sure that the  
19 outside ventilation rate did meet what the  
20 standards had required.

21 So if you were looking at your  
22 mechanical plans, and you looked in the takeoff  
23 sheet there, and it showed what the outside air  
24 requirement is, making sure that that did match  
25 what was filled out on the forms that are

1 currently required in the standards.

2 And in the construction phase this gets  
3 into a little bit more of a tricky situation,  
4 because there's a lot of different ways or  
5 potential ways that you could try and measure  
6 outside air or estimate what the outside air  
7 quantity is.

8 Here we're kind of looking at making  
9 sure that however it is going to be used, that it  
10 was calibrated and it has been measured. If you  
11 have a flow station, for example, in the outside  
12 air intake, that would be probably the best way in  
13 order to verify that you are actually measuring  
14 the outside air.

15 Another option would be to develop some  
16 sort of a curve. And the curve idea was actually  
17 in the manual. And the idea here is that during  
18 test and balance is that if the test and balance  
19 person is measuring what the outside air flow rate  
20 is, and then run the system through its paces so  
21 that you vary your speed on supply fan from  
22 minimum to maximum, and develop some sort of a  
23 correlation between what they're measuring in  
24 outside air and what the speed drive was  
25 developing, or what the speed on the speed drive

1 was, something like that, or if it's an inlet I  
2 vane, what the vane position was, things like  
3 that.

4 That particular curve could be used then  
5 within the controls, themselves, in order to  
6 calculate what the outside air flow is, and what  
7 it should be.

8 And then you'd also want to make sure  
9 that during the construction just making sure that  
10 you disable any economizer control so that you  
11 don't have an unwanted interaction between the  
12 different control strategies.

13 One of the problems that we ran into is  
14 that each one of these systems can be controlled  
15 in a variety of ways. And so we can't really  
16 stipulate you shall control it this way. One  
17 person may have one methodology, and the other  
18 person has another methodology, and they're both  
19 completely adequate.

20 So what we tried to do is we tried to  
21 frame our acceptance based around a general  
22 principle that you measure it. And however you  
23 determine your measurement is acceptable as long  
24 as you can back it up and verify it.

25 Next slide. So we come down to in the

1 equipment startup, itself, looking at step one.

2 First thing we want to do is we want to drive all  
3 of our VAV boxes to a minimum position. This is  
4 just one point on the curve where if all the boxes  
5 are in heating, for example, then you're at your  
6 minimum air flow. We would want to make sure that  
7 we have a minimum, the same minimum amount of  
8 outside air brought in throughout the entire  
9 modulation.

10 So under the first step you would look  
11 at measuring the outside air flow and making sure  
12 that it did correspond with the proper  
13 requirement, within plus or minus 10 percent.

14 This measurement, like I say, can be  
15 from the flow station; it can be from the curves  
16 that you may have developed during test and  
17 balance. It's kind of up to the contractor as far  
18 as how they plan on verifying it. But, the  
19 bottomline is you have to show a number that  
20 matches what the minimum air flow really has to  
21 be.

22 And another item that we put in here is  
23 to make sure that we have systems that are  
24 somewhat under control. When you make a step  
25 change in your control sequence you want to make

1       sure that your system doesn't fluctuate wildly, or  
2       get out of control. And so that's why we put in a  
3       requirement here to make sure that the system does  
4       stabilize within a reasonable amount of time, and  
5       we're looking at like 15 minutes that when you do  
6       make your change you're not going to see it  
7       instantaneously, but within a 15-minute period you  
8       should be able to see your system stabilize and  
9       that you are measuring or being able to predict  
10      what your outside air and verify what your outside  
11      air flow rate is at that particular time.

12               And then we would, in step two, next  
13      slide, we would just go in the opposite direction.  
14      We would drive all of our boxes back open again,  
15      so that we're back to a full flow situation. And  
16      start all over again.

17               You know, there again the concept is you  
18      can put your boxes at any particular point that  
19      you want; you can modulate it through the whole  
20      sequence. But at least if we have two points, if  
21      we know that at an absolute minimum and an  
22      absolute maximum that we're getting the same  
23      outside air value, we can make a pretty safe guess  
24      that within the interim it's going to hopefully,  
25      the algorithm is going to give you the same

1 result.

2 Yes, Ken.

3 MR. GILLESPIE: Ken Gillespie, PG&E. A  
4 couple questions. Is there any instrumentation  
5 requirement in terms of capability of how this is  
6 going to be measured? We're giving the contractor  
7 the opportunity to choose his test method, but do  
8 we have any criteria as to which, what kind of  
9 instrumentation he -- or the requirements of that  
10 instrumentation he chooses to use?

11 MR. LUSKAY: I don't believe that we  
12 have test equipment requirements. You mean as far  
13 as the equipment --

14 MR. GILLESPIE: Or measurement. I would  
15 say measurement requirements.

16 MR. LUSKAY: Measurement requirements.  
17 You mean like using a short ridge versus --

18 MR. GILLESPIE: Well, I won't tell them  
19 what equipment to use, but I would like to  
20 probably know that that equipment is capable of  
21 measuring it to some level.

22 MR. LUSKAY: So if we have a stipulation  
23 in there that any equipment used must have been  
24 certified and calibrated within the past --

25 MR. GILLESPIE: Some kind of criteria.

1 MR. LUSKAY: Okay.

2 MR. GILLESPIE: I'm rather concerned  
3 about the use of air flow stations and outside air  
4 because they're very pressure dependent. And  
5 having done this a few times in my lifetime,  
6 sometimes I don't even get any measurement because  
7 of the wind current problems.

8 And you can go out there one day and  
9 take a test and come back the next day and get  
10 totally different information because the ambient  
11 conditions are that different.

12 Are we defining a criteria about how  
13 close he has to meet the minimum?

14 MR. LUSKAY: Within 10 percent is what  
15 we're shooting for.

16 MR. GILLESPIE: That's pretty severe in  
17 terms of the accuracy of the actual measurement.  
18 I would say it's --

19 MR. LUSKAY: You don't think that --  
20 it's too stringent?

21 MR. GILLESPIE: Yeah, it's going to be  
22 hard to meet. Just in the uncertainty of the  
23 measurement.

24 MR. JOHNSON: Let me point out, Ken,  
25 just interrupt you just a moment. Appendix A in



1       this particular document is the recommended  
2       specification for the Associated Air Balance  
3       Council's, it's their testing adjusted balance  
4       specification. And that was -- their tolerance is  
5       10 percent. And that's where we got the 10  
6       percent from.

7               MR. HOGAN: If I might add, John Hogan,  
8       City of Seattle, we have a 10 percent rate for air  
9       and water, and that's also from ASHRAE 90.1.

10              MR. JOHNSON: Now then, Ken, your  
11       question is is that an acceptable tolerance or  
12       not. I mean saying it versus, you know, actually  
13       being able to achieve it is another story, so --

14              MR. GILLESPIE: I just think --

15              MR. JOHNSON: -- that would be helpful.

16              MR. GILLESPIE: I just like these things  
17       to be realistic. It's great to quote a number,  
18       but getting it there is a whole other process.

19              MR. LUSKAY: Tom, do you have a  
20       question?

21              MR. TRIMBERGER: Tom Trimberger, CALBO.  
22       Typically, you know, when the Associated Air  
23       Balance Council, or some testing agency, comes in  
24       and says okay, this is what the numbers are. And  
25       it's either going to be within 10 percent or it's

1 not.

2 Either way the testing agency has done  
3 its job. And those numbers can be accepted by the  
4 designers or not.

5 What you're saying is a different  
6 criteria. You're saying it's 10 percent and  
7 that's it. Associated Air Balance Council  
8 requirements for balancing is that's the goal and  
9 that's the aim. But if you don't get it, the  
10 system can still be approvable.

11 Whereas you're going to step in and say  
12 I don't care what the building designer says, if  
13 you don't get it it's not approvable? Is that  
14 what I'm hearing?

15 MR. LUSKAY: No. Well, the building  
16 designer has already calculated what the minimum  
17 outside air requirement is. We're just making  
18 sure that the system delivers that minimum  
19 requirement throughout its entire modulation  
20 sequence.

21 And so the design isn't being changed in  
22 any way.

23 MR. TRIMBERGER: No, but the acceptance  
24 of it is because if it's 11 percent off, it can  
25 still be acceptable to the designer, but it would

1 not be acceptable to the state. Is that what  
2 we're saying?

3 MR. JOHNSON: So if we get some ideas on  
4 what that number really should be, we've used 10  
5 percent because that's what's in there. If we  
6 think it should be 15 or 20, is a reason to get  
7 behind it. But, yeah, that's exactly what -- I  
8 mean at some point that's what we need to do.

9 I mean interesting the Health and Safety  
10 Code doesn't say the number, so I'm thinking it's,  
11 you know, you could argue it's zero percent. Or  
12 you could argue it's whatever the owner accepts,  
13 or the employee accepts, essentially, is what I  
14 think the way they put it. The way it would --  
15 so we're open to input on that.

16 We used this number partly because it's  
17 reference-able to their standard, but you're  
18 right, it's probably using a different way and we  
19 have other reason to believe --

20 MR. TRIMBERGER: Why do you have a  
21 number? If you've got somebody that signs it that  
22 says it's been balanced and the balance is  
23 approved, do you need a number?

24 MR. JOHNSON: Well, in the case of  
25 outdoor air the current standards require that you

1       verify that it meets that outside air flow rate.

2       And so what we're actually doing is widening the  
3       margin from zero percent to 10 percent, if you  
4       want to look at it that way.

5               Because the current standards require it  
6       be that design number.

7               MR. OTTO: But you're asking -- John  
8       Otto, General Services. If you're asking the  
9       designer, responsible designer to certify to the  
10      acceptability of the system, wouldn't that be  
11      irrespective of this ratio of tolerance?

12              MR. LUSKAY: It still gets back to the  
13      design can be accurate, but if the equipment isn't  
14      bringing in what the design is calling for, that's  
15      what we're trying to address here.

16              And VAV systems are inherently difficult  
17      that a lot of times they are tested under full  
18      flow operations and someone may specify yeah,  
19      we're bringing in x percent of outside air, or x  
20      cfm of outside air, because that's what the design  
21      requires. That for this system, air handling unit  
22      number two, we've got a total flow rate of 14,000  
23      cfm and our minimum outside air requirement is  
24      3000 cfm. And we verified that.

25              But, as that supply fan starts to

1 modulate, especially in a VAV when you start to  
2 vary that amount of air flow, you're changing the  
3 amount of outside air that's actually coming into  
4 the system. The 3000 cfm needs to be there all  
5 the time because the people within the space, the  
6 reason that the ventilation is there hasn't  
7 changed.

8 The flow rate in the system is being  
9 changed by loads within the space, but the  
10 ventilation requirement is not. So that 3000 cfm  
11 needs to be brought in, regardless of whether  
12 you're supplying 14,000 cfm or 10,000 cfm.

13 And that's where it comes -- is the  
14 requirement that the code currently says that you  
15 shall provide minimum outside air requirements to  
16 the spaces at all times. And the designer, it  
17 doesn't affect the design; it's in the operation  
18 of the system, itself. And that's what we're  
19 trying to address.

20 MR. OTTO: Would the variable tolerance  
21 be more acceptable or less acceptable for an OSHPD  
22 controlled hospital facility where you'd have  
23 considerable more rigidity in terms of the outside  
24 air?

25 In other words, once I establish an

1 outside air -- I'm not mechanical, but anyway, for  
2 a hospital's emergencies area, okay, then you're  
3 saying I have a 10 percent latitude for that in  
4 the energy efficiency regs.

5 If I'm the responsible designer would  
6 that be acceptable to me for a hospital as opposed  
7 to, you know, shopping center or other kinds of  
8 retail --

9 MR. PENNINGTON: The hospital is outside  
10 the scope of the regulation.

11 MR. OTTO: Totally, anyway.

12 MR. PENNINGTON: Yeah.

13 MR. OTTO: Oh, okay.

14 MR. JOHNSON: I think the issue here is,  
15 and this is something we should probably address,  
16 and we can modify this proposal if we need to, but  
17 the issue is that the minimum or more is met. I  
18 mean the standard says you need to meet this  
19 minimum amount or you can provide more air. It's  
20 okay to provide more, but you can't provide less.

21 And so that's really what the outdoor  
22 air requirement states. What we were trying to do  
23 is say well, if the designer specified a number,  
24 let's put a number band on that just so we know we  
25 don't over-ventilate and have the associated

1 energy consumption that goes along with that over-  
2 ventilation.

3 If we've got a number you're trying to  
4 hit let's go with that. So that's where we put  
5 that bound in.

6 I think in the absence of having a test  
7 requirement, it's difficult to have an acceptance  
8 test. And so I think the real issue there is if  
9 you have no -- if you leave it as, well, whatever,  
10 if you leave a pretty wide range you don't have a  
11 range there, then you really don't have a test.

12 And so, because a test is a pass/fail,  
13 and if there's no number there there's no pass/  
14 fail criteria, per se.

15 So what we're trying to say, we want to  
16 have a test. The standard says minimum. We want  
17 to put some bounds on that and say, well, let's  
18 shoot for this number. And so if we can get some  
19 better idea of what that might be, and how to come  
20 up with that, that would be useful.

21 And whether we should have it just as a  
22 minimum, or we should, say, have no bounds, say at  
23 least this amount, and then we can go from there.

24 MR. AHMED: Jeff, are you going to set a  
25 method, how to do it? Because you could arrive at

1       this number with various different instruments.

2               MR. JOHNSON: I think that's one of the  
3       issues, and the challenge is for us not to specify  
4       protocol, but a test requirement. And they're two  
5       different things.

6               A protocol would say this is how you do  
7       it. What we're saying is this what we want the  
8       result to be.

9               MR. AHMED: Right.

10              MR. JOHNSON: And you figure out which  
11       way to do it based on the system you've designed,  
12       and the way you think you can best verify that.  
13       And if we get into the protocol it gets to be a  
14       little problematic because someone may use flow  
15       hoods, somebody may use, you know, there's a lot  
16       of ways that this can be done. And we don't want  
17       to get that specific.

18              So that's why we kind of went that  
19       route.

20              Something else I'll just point out for  
21       your information on the April 2002 issue of  
22       "ASHRAE Journal" is an article on minimum outside  
23       air damper control. And this particular article,  
24       I think it's actually -- it explains what we're  
25       talking about here in detail about what the



1 mechanical designer needs to go to to actually  
2 look at trying to achieve this.

3 And I think it's -- they've got a number  
4 of references there, and so probably could contact  
5 the authors and get some of their feedback on this  
6 proposal, as well.

7 MR. ALCORN: Okay. I think Ken has a  
8 comment.

9 MR. GILLESPIE: Ken Gillespie, PG&E.  
10 Does the standard 62 talk about uncertainty at all  
11 in terms of, you know, percent, per person? I  
12 mean the problem we're dealing with here is a  
13 measurement of uncertainty associated with some  
14 kind of benchmark or some kind of level that is  
15 defined by code.

16 And determining how they should overlap  
17 is really the point. If there is a requirement  
18 for a minimum as an absolute minimum, then the  
19 uncertainty can use that as the lower bound. So  
20 you're saying it's going to be no less than, you  
21 know; and then determine what your upper bound is,  
22 basically.

23 Anyway, that's the point that's going on  
24 here is we've got two different issues that are  
25 kind of overlapping each other.

1           MR. JOHNSON: Yeah, as far as I know  
2           there is no quote, uncertainty bound on the air,  
3           because it's typically done as a design outside  
4           air rate. It's not really done as a measure, and  
5           I don't think anyone intends on doing that.

6           And then the standard's pretty explicit  
7           that it's a minimum. And that there is no maximum  
8           established.

9           MR. ELEY: I have a question I guess for  
10          you, Larry. Charles Eley, Eley Associates.

11          The procedure you outlined looks at the  
12          volume of air brought in at the system, the air  
13          handler. What about special spaces like  
14          conference rooms or even looking at ventilation  
15          effectiveness.

16          Are you going to take this to the next  
17          step in terms of verifying -- I mean, bringing the  
18          air in doesn't mean that it's getting to the  
19          people, I guess, is what --

20          MR. LUSKAY: No, that's true. The way  
21          that the manual, they talk about --

22          MR. ELEY: The manual, you mean? Which  
23          manual are you --

24          MR. LUSKAY: Let's see, well, it's the  
25          Title 24 nonresidential manual which gives

1 examples and is more of an explanatory document  
2 supplement to the actual code language, which is  
3 in Title 24.

4 It discusses that and realizes that that  
5 can happen, but the way the code is written is  
6 that they have basically accepted that if you  
7 bring in the outside air into the system on a  
8 system level, that you can effectively be having  
9 air that's going to one zone that is not utilizing  
10 all of its ventilation. It's being over-  
11 ventilated, so that extra ventilation is in the  
12 return system being brought back in, mixed with  
13 everything else, and then that's the way it sort  
14 of compensates within a space that may not  
15 actually be getting a true minimum.

16 It says that you can follow ASHRAE 62,  
17 which has a different calculation which would be  
18 more of an effectiveness which you look at room by  
19 room in order to determine what your minimum  
20 requirement is.

21 But the standard doesn't quite require  
22 that you follow 62. And they also provide an  
23 option for, they call it transfer of air. That  
24 you can take air from one space and bring it over  
25 to another within the confines of the building,

1 from what I understand. And that would also be as  
2 what you bring that outside air into a room that  
3 may not be receiving it on a system level.

4 MR. ELEY: I'm familiar with those  
5 requirements, but the testing procedures that  
6 you're proposing would only deal with the system  
7 level, though.

8 MR. LUSKAY: Exactly, because that's the  
9 way the current standard is written. It just says  
10 you must bring in this minimum amount of outside  
11 air, and that's all that it requires.

12 MR. ALCORN: Tony.

13 MR. PIERCE: Yeah, Tony Pierce with  
14 Southern California Edison. A question, since  
15 we're talking about outside air, the other  
16 requirements for control, purge, preoccupancy  
17 purge, continuous ventilation versus thermostatic  
18 switching of the fan. Would you address those  
19 with the proposed acceptance? I mean that's sort  
20 of part of the controls. It goes back to the  
21 earlier -- is the control sequence correct.

22 MR. JOHNSON: Right. There were three  
23 areas that we planned on looking at, essentially.  
24 One was the minimum requirements were met. That  
25 was the main area we were focusing on.

1           Essentially because it's an existing  
2           requirement, we just -- taking the existing  
3           completion requirement, bringing it within the  
4           scope of the certificate of acceptance, and not  
5           changing the section in ventilation, not trying to  
6           enforce more of those areas there.

7           If there's a sense that we should do  
8           that, that's something we'd need --

9           MR. PIERCE: Well, I guess I would  
10          advocate for looking at more of those. I mean I  
11          appreciate what Ken's throwing out here in terms  
12          of the uncertainty of the air band, and trying to  
13          ascertain the actual outside air flows.

14          But then in the case of an elementary  
15          classroom, for example, where the thermostat  
16          switches the fan off when the temperature is  
17          satisfied, and therefore we're not ventilating,  
18          going completely against the code, if there was  
19          just more enforcement of that we'd probably go a  
20          lot further than trying to get 10 percent or 15  
21          percent --

22          MR. LUSKAY: Tony, we do, actually. In  
23          section (b) (2) (a) where we talk about constant  
24          volume packaged HVAC systems, that's where we  
25          actually get into those types of controls, where

1 we have a very simple system and we probably have  
2 some sort of programmable thermostat.

3 I don't have that up on a slide as an  
4 example, but it's in the report. And that's where  
5 we address those particular issues. And the way I  
6 have the test procedure is saying, making sure  
7 that during occupied periods that the fan runs  
8 continuously. During unoccupied periods it's okay  
9 to allow the supply fan to cycle on and off based  
10 on a call for heating or cooling. And that would  
11 be the area that it would be addressed.

12 In a large built-up system the fan  
13 probably is not going to cycle in any manner.  
14 It's mostly on the small ones. And that is  
15 addressed in the packaged HVAC controlled section.

16 MR. PENNINGTON: Where is that  
17 referenced? I think people are looking for it.

18 MR. LUSKAY: Oh, sorry. Let's see,  
19 page, section (b) (2), yeah, page B2.

20 MR. ALCORN: John?

21 MR. HOGAN: John Hogan, City of Seattle.  
22 I think if we're talking about the built up VAV  
23 systems, you want to make sure you've got the  
24 outside air working, but the other thing that  
25 impacts the energy is whether the box isn't

1 working correctly. Whether it's, you know, really  
2 going down to some minimum setting, or it's  
3 staying at 50 percent or never closing down.

4 If the California code includes a damper  
5 leakage requirements and things that are in 90.1,  
6 and folds and those things, it's verifying that  
7 some of those things work. And that seems  
8 important issues to make sure are addressed here.

9 MR. JOHNSON: Just as a comment, we, in  
10 the process of putting in here the scope of these  
11 requirements, there were a couple other areas. We  
12 actually had to prioritize some of the things on  
13 sort of an A, B, C priority list.

14 And the VAV system at the box level, and  
15 chilled water system controls sort of fell in the  
16 C priority level, meaning that they were going to  
17 take considerable effort to put together and that  
18 we wanted to focus on the requirements that we're  
19 currently proposing today as a first step.

20 So, while I acknowledge those are areas,  
21 we want to get this thing, you know, kind of get  
22 this proposal to understand where things were  
23 going, and also focus on some of these, the things  
24 we talked about before we started to look at those  
25 and get those well detailed, and to bring those

1       into a public process for comment.

2               So, they're on the list but we're not  
3       sure, you know, we want to get through this phase  
4       first and then decide that they're 2005 or 2008  
5       standards issue.

6               MR. ALCORN: Great. Are there any more  
7       questions or comments for Jeff or Larry?

8               Okay, well, looks like we're right on  
9       time. We have a one-hour lunch. We'd like to be  
10      back at 1:00 sharp so we can keep our agenda.

11              Thanks very much. See you at 1:00.

12              (Whereupon, at 12:00 noon the workshop  
13      was adjourned, to reconvene at 1:00  
14      p.m., this same day.)

15                      --o0o--



## 1 AFTERNOON SESSION

2 --o0o--

3 MR. ALCORN: -- we can finish by 2:30,  
4 because a couple of the participants need to go  
5 meet with Commissioner Pernell. So I've talked  
6 with Jeff Johnson about that and we think that we  
7 can go ahead and accelerate and get this done in  
8 the next hour and 25 minutes.

9 So, with that, Jeff, if you're ready to  
10 start.

11 MR. JOHNSON: Okay. Part of what we're  
12 going to go over this afternoon was some of the  
13 prescriptive criteria. And I think a lot of the  
14 discussion we had earlier about the testing and  
15 controls and nomenclature and where things are at  
16 will be a part of that.

17 We'll have Larry walk through an example  
18 of that, and then Don Felts will chime in via  
19 phone and talk a little about the process, itself,  
20 the acceptance process. And I think that's the  
21 other area we want to get some comment on.

22 In terms of the prescriptive elements  
23 we're looking at that we've included in this  
24 proposal, we've got both economizers for all  
25 buildings, and their distribution systems located

1 outside the conditioned space, which for some  
2 buildings is all of them; for others, is not. And  
3 I think that's part of the discussion -- or part  
4 of the -- one of the issues.

5 Some of the issues related to  
6 economizers were -- I mean to duct work outside  
7 the conditioned space, the losses are high in  
8 residential, they're a lot higher in nonres. And  
9 so that's why we were continuing to focus on  
10 those.

11 And economizers, I'll cover those now.  
12 Why don't we go to the next slide. Turns out that  
13 the packaged equipment is about 75 percent of  
14 PG&E's market, according to some work that's being  
15 done, that was done by PG&E for the CASE  
16 initiatives.

17 There are a lot of known issues with the  
18 operation. We're ongoing with the CEC through  
19 PIER project, and we're in the process of  
20 characterizing some of these failures.

21 But through our conversations with folks  
22 and the studies that have been done, not working  
23 right from installation is one of the conditions  
24 that is out there. I mean they just flat out  
25 weren't hooked up.

1           And essentially the idea on these  
2       prescriptive requirements is, you know, putting an  
3       economizer on is a prescriptive measure. You can  
4       always model the building and not install one. If  
5       you choose the prescriptive option you would be  
6       required to do the acceptance testing on that  
7       particular piece of equipment.

8           On air distribution systems this really  
9       builds off the AB-970 requirements, so it's  
10      building off existing requirements in the  
11      standards.

12          The testing essentially would occur on  
13      all ducts in unconditioned spaces, and you would  
14      still need this third-party field verification to  
15      claim the duct leakage reduction ACM credit. We  
16      would reference the 6 percent leakage rate that's  
17      in the current standards as the test criteria and  
18      go from there.

19          There was some discussion about during  
20      this process about using the test and balance  
21      contractors and their procedures for doing duct  
22      testing. And we received a lot -- we thought  
23      about is there a way of coming up with this in  
24      terms of pressure differentials, because they use  
25      a lot of Pitot tube measurements, and look at

1 pressure measurements.

2 The other thing that we looked at was  
3 whether or not there could be some cfm or airflow  
4 measurement process along with pressure  
5 differentials as a way of looking at duct leakage.

6 And the feedback we got was that the  
7 duct blaster testing is the preferred way. It's  
8 something that can be done during the construction  
9 process where it's very difficult to measure,  
10 well, you could actually test duct leakage other  
11 ways at the end of construction. Duct blasters  
12 allowed you to do quality control along the way,  
13 and the contractors that had become familiar with  
14 and were using duct blasters, just ended up  
15 incorporating them as a part of a routine way the  
16 way they constructed their buildings.

17 And so it was the most efficient way for  
18 them to test their systems, get feedback to  
19 installers. And once that feedback had occurred  
20 and they figured out where the problems were, the  
21 installers were able to pretty rapidly correct  
22 those problems and it became sort of a check  
23 rather than a thing you had to do on every system.

24 So, we felt that the current ACM  
25 requirements were the right approach, given the

1 industry and given the feedback that we received,  
2 and therefore all we did was essentially say in  
3 the testing say meet that current criteria through  
4 the acceptance test.

5 So, part of the reason I stated that,  
6 SMACNA had faxed in a comment. This is just to  
7 make you aware of they've submitted some comments  
8 in writing. And we've been through some of this  
9 and we'll continue to work with them on explaining  
10 why we went the direction we did, and hopefully  
11 have them at the next workshop for hopefully in  
12 support of this.

13 So the other area we're going to be  
14 covering as a part of these requirements will  
15 include lighting controls. Lighting controls are  
16 required on all buildings for AB-970, automatic  
17 controls.

18 And essentially these credits aren't  
19 energy neutral credits unless you've got effective  
20 controls. And so the key areas of control we're  
21 looking at are time of day control, occupancy  
22 sensors, manual daylight switching and daylighting  
23 controls. Those are the key areas of lighting  
24 controls we're going to focus on.

25 The one area I think that we all felt

1 was -- just the folks involved in the study, was  
2 sort of a no-brainer had to do with daylighting  
3 controls. And I'll have Larry go through --  
4 first, I'll have Larry go through an example in a  
5 minute to talk about daylighting controls and  
6 about the test criteria for that.

7 But the daylighting controls seem to be  
8 one that there's a lot of credit available; it's  
9 something that a lot of folks are trying to  
10 promote. And getting those to reliably work, you  
11 know, sort of the first time around was, we felt,  
12 to be very important.

13 So, before we get into that, are there  
14 any comments on the scope of the prescriptive  
15 criteria?

16 MR. ALCORN: Ken.

17 MR. GILLESPIE: If you go back up to  
18 that overhead, testing requirements on ducts in  
19 unconditioned spaces, you've got a comment there  
20 about third-party verification, and I want it  
21 explained.

22 MR. JOHNSON: Okay. Essentially the  
23 idea on third-party verification, third-party  
24 field verification is a requirement if you, in  
25 your modeling, choose the tight duct credit.

1 MR. GILLESPIE: Currently? Under the  
2 current --

3 MR. JOHNSON: In the current standards.  
4 So if you choose a tight duct credit when you're  
5 doing the computer modeling then you need to,  
6 required to have a third-party verification in  
7 order to take that credit.

8 MR. GILLESPIE: Does the standards  
9 specify who is capable of doing that third-party  
10 test?

11 MR. JOHNSON: Yeah. Right now it's the  
12 CHEERS certified raters are the folks that do that  
13 test.

14 MR. TRIMBERGER: Tom Trimberger with  
15 CALBO. I didn't understand quite what it is.  
16 You're saying so 6 percent would be the standard,  
17 and a third-party verifier if you take compliance  
18 credit for it?

19 MR. JOHNSON: That's correct.

20 MR. TRIMBERGER: But it would be a --  
21 this is being written into as a mandatory feature  
22 for the installing contractor or someone to verify  
23 the 6 percent anyway, is that correct?

24 MR. JOHNSON: This confuses me  
25 sometimes, too, so let me just double check that.

1 Bill can probably chime in here, as well.

2 Yeah, that's correct. It basically says  
3 that -- it's actually on page 11 is the text. And  
4 it says that certified air distribution ducts and  
5 plenums do not leak more than 6 percent of total  
6 measured fan flow as specified in the  
7 nonresidential ACM manual.

8 And the exception is VAV systems, non  
9 unitary air conditioners and heat pumps with ducts  
10 installed in spaces other than unconditioned  
11 spaces between insulated ceilings and roofs.

12 So this primarily applies to package  
13 equipment with ducts in an unconditioned ceiling  
14 space.

15 MR. TRIMBERGER: Is the 6 percent --  
16 where's the basis or background? Is that 6  
17 percent still a good number? You know we've  
18 looked and said residential small systems we can  
19 do that, but --

20 MR. ELEY: Well, that number, I think,  
21 that number came from the residential standards.  
22 This particular class of duct system that this  
23 applies to is essentially a residential scale duct  
24 system. It's built with construction techniques  
25 very similar to single family homes.



1 MR. TRIMBERGER: Okay, so residential is  
2 like small packaged systems up to 5 ton.

3 MR. ELEY: Right, so this is --

4 MR. TRIMBERGER: If you go above 5 --

5 MR. ELEY: There's no requirement.

6 MR. TRIMBERGER: -- ton, do these apply  
7 to commercial?

8 MR. ELEY: No.

9 MR. JOHNSON: And the way this is  
10 written, in fact, it would apply. It applies to,  
11 regardless of the size of the --

12 MR. ELEY: Okay.

13 MR. JOHNSON: -- large package  
14 equipment.

15 MR. TRIMBERGER: So you're saying if  
16 it's a --

17 MR. ELEY: I guess I was answering --

18 MR. JOHNSON: Yeah.

19 MR. ELEY: -- relative to AB-970.

20 MR. JOHNSON: Okay.

21 MR. TRIMBERGER: Okay, for the --

22 MR. ELEY: But not your proposal.

23 MR. TRIMBERGER: -- for this, you know,  
24 if I've got a 10 ton unit, it's ducted in a  
25 commercial space, this would apply?

1 MR. JOHNSON: That's correct.

2 MR. PENNINGTON: If the ducts are in  
3 unconditioned space.

4 MR. TRIMBERGER: Or if it's a 20 ton.

5 MR. PENNINGTON: If the ducts are in  
6 unconditioned space.

7 MR. JOHNSON: So for example, say in a  
8 big box retail store where the insulation was at  
9 the ceiling plane, so you had to, say insulation  
10 on the roof deck, or it was fiberglass bat  
11 insulation under the roof, and then the ducts were  
12 brought in and it was a dropped ceiling, those  
13 would not require test--

14 MR. TRIMBERGER: That's an easy case.  
15 The problem is when you drop a T-bar ceiling in  
16 there and then you've got an unconditioned space  
17 there.

18 MR. JOHNSON: That's correct, and that's  
19 where you've got, if the ducts are below the  
20 insulation level, meaning on the conditioned space  
21 side of the insulation, then they would not  
22 require testing.

23 If you drop the T-bar ceiling in and put  
24 insulation on top of that T-bar ceiling, the ducts  
25 were running in the space above that, it would

1       require it.

2               MR. TRIMBERGER:  That's a common  
3       installation --

4               MR. JOHNSON:  We know.

5               MR. TRIMBERGER:  -- in existing places.  
6       That will be real hard to get that 6 percent.  You  
7       basically scrap what you got and start over.

8               MR. PENNINGTON:  What do you mean scrap  
9       what you got?

10              MR. TRIMBERGER:  You got an existing  
11       system in an unconditioned attic, I doubt if  
12       you've got any substantial amount of duct work at  
13       all, you're going to have to tear it out and  
14       replace it and reseal everything you got.

15              MR. PENNINGTON:  So you're thinking  
16       about a tenant improvement kind of situation?

17              MR. TRIMBERGER:  Correct.

18              MR. PENNINGTON:  This is really aimed at  
19       new construction.  We'll have to --

20              MR. TRIMBERGER:  So does this not apply?

21              MR. PENNINGTON:  We'll have to think  
22       about the application for alterations.

23              MR. TRIMBERGER:  Yeah, I think we do.

24              MR. JOHNSON:  This really applies to a  
25       new system, and there's a couple ways you can do

1 it. One is through the insulation techniques,  
2 themselves. Either by using mastics or the  
3 banding.

4 There's also third-party sealants that  
5 you can apply after the system's in place. And so  
6 this would primarily apply to newly constructed  
7 duct work.

8 MR. TRIMBERGER: Has anyone ever -- I'm  
9 just kind of, you know, the duct blasting that  
10 I've seen, has anybody ever done duct blasting  
11 with registers in a T-bar ceiling?

12 MR. PENNINGTON: The primary researcher  
13 behind all of this stuff is Mark Modera. And, you  
14 know, he's advising that this same credit is  
15 reasonable in a small commercial situation. And  
16 LBNL has been doing some duct sealing testing on  
17 these kinds of systems.

18 So, I mean this proposal is -- that  
19 proposal is going to get written up and presented  
20 separately. And we don't have the principals that  
21 are working on it here to talk to you about it.

22 MR. TRIMBERGER: Yeah, I'm just  
23 extremely skeptical of doing this in commercial  
24 buildings and making that work. Maybe I'm  
25 unfounded in that, but I've come from a heat and

1 air background and I've been there in the  
2 contractor and the design community, as well. And  
3 you're going to mandate a 6 percent for new  
4 systems and then we've got a question mark for  
5 existing systems. That's a difficult --

6 MR. PENNINGTON: I think we need to  
7 think through the tenant improvement situation,  
8 you know.

9 On the other side of the issue is that  
10 the energy savings or consequences of having leaky  
11 ducts in commercial systems are significantly  
12 worse than for residential.

13 And so that's saying a lot, you know.  
14 We have a problem we need to try to address.

15 MR. ALCORN: John.

16 MR. HOGAN: John Hogan, City of Seattle.  
17 Let me make one observation for new construction.  
18 I can't believe that the code would allow people  
19 to install the insulation on top of the T-bar  
20 ceiling since we know how leaky that is with light  
21 fixtures and everything.

22 But, --

23 MR. ELEY: Welcome to California.

24 (Laughter.)

25 MR. HOGAN: Right. But given this

1 requirement it seems it provides an impetus for  
2 people to do continuous insulation on top of the  
3 roof deck if they want to do the ducts inside.

4 So when people are thinking about the  
5 design this might have some impacts so they do  
6 better design.

7 MR. PENNINGTON: That's a good point.  
8 There may very well be an either/or kind of  
9 situation here. You know, either you get the  
10 insulation in the right place, or you have to do  
11 duct sealing.

12 MR. AHMED: Excuse me, I have a  
13 question. I heard you say that the ducts in  
14 unconditioned space should have a leakage of no  
15 more than 6 percent?

16 MR. JOHNSON: That's correct.

17 MR. AHMED: And to get the ACM credit  
18 how low does it have to go?

19 MR. JOHNSON: It would be at 6 percent,  
20 and the difference is that you would need to have  
21 that certified by an independent third party.

22 MR. AHMED: Oh, okay.

23 MR. JOHNSON: And field verified,  
24 meaning --

25 MR. AHMED: So if it's field verified

1       you get a credit; if it's not field verified --

2               MR. JOHNSON:  You don't get a credit.

3               MR. AHMED:  Then how do you get the  
4       certification?

5               MR. JOHNSON:  Certification is done  
6       right now through the CHEERS organization.  CHEERS  
7       certifies the -- you need to have a CHEERS  
8       certified rater go out and test the duct work, or  
9       witness the test using their -- with some sampling  
10      of their own equipment so that they can verify  
11      that the leakage level was met.

12              MR. GILLESPIE:  What if you don't use  
13      third-party testing?

14              MR. JOHNSON:  You don't get credit.  You  
15      just have to do it.

16              MR. AHMED:  So, I mean in both ducts  
17      have to have 6 percent leakage, but if you use a  
18      third party you get a credit; if you don't, you  
19      don't get a credit?  That's basically the  
20      difference?

21              MR. JOHNSON:  Yes.

22              MR. ALCORN:  Bob.

23              MR. BURT:  Bob Burt.  This is an  
24      exception to the generalization you made earlier  
25      that you were expecting the whole process would be

1 the normal process used in contract exception --  
2 acceptance here indicating that this is something  
3 that's part of our drill now. You're making it  
4 something that previously, if you wanted a credit  
5 you could do it that way. Now you're saying it's  
6 a requirement?

7 MR. JOHNSON: No, not necessarily. I  
8 think what we're saying is that we aren't changing  
9 how you get a credit. What we're saying is that  
10 as in economizers and these other systems that  
11 there are significant impacts to poor quality  
12 installation, significant energy impacts that sort  
13 of violate the intent of the standard.

14 And that this was chosen as one that the  
15 contractor can, as they're doing the installation,  
16 and before they go off the job, have the ability,  
17 as a part of their normal business, to go through  
18 and do this testing and certify that it's been  
19 tested.

20 Now, they don't get a credit for that.  
21 But it's something that the energy savings are  
22 there and we feel it's worthy of requiring them to  
23 do so.

24 MR. BURT: I was just clarifying because  
25 we earlier made a broad generalization, this is an



1 exception?

2 MR. JOHNSON: I'm not sure if this is  
3 anything any different than installing an  
4 economizer or something, I mean, lighting  
5 controls, just making sure that it's doing -- it's  
6 working according to its intent.

7 Just hopefully getting air to where it's  
8 supposed to go, not blowing in the ceiling space.

9 MR. BURT: As far as energy savings goes  
10 I have no argument. I'm just making sure that the  
11 concept is clear.

12 MR. JOHNSON: Yes. The other thing I'd  
13 point out in this duct work is that I think  
14 actually this proposal is very consistent with  
15 some of the arguments that were heard during the  
16 residential proceedings about who should be doing  
17 it, about testing that I think contractors were  
18 saying, gee, you know, as a part of our normal  
19 business we realize this is an issue; and some  
20 contracting firms have taken this on as a way of  
21 doing business.

22 And this allows them to do exactly that.  
23 It doesn't require someone to come in and witness  
24 their work, as a new requirement. But it says,  
25 you know, that a part of your business should be

1 to deliver to the customer low leakage ducts. And  
2 this is all, we're just spelling out what exactly  
3 that means.

4 Okay, why don't we have Larry run  
5 through the daylighting controls, just to give you  
6 a perspective on what we're talking about in terms  
7 of lighting controls. And then we can get into  
8 the acceptance process.

9 MR. LUSKAY: Let's see, on daylighting I  
10 chose this one as an example because there's quite  
11 a few things that need to be looked at in plan  
12 review. In daylighting in particular there's a  
13 lot of things that can influence whether you're  
14 actually going to have a good application for  
15 daylighting or not.

16 And the first one is obviously getting  
17 an idea of what sort of external shading is going  
18 to occur at your particular facility. Some of  
19 this, it's a little bit hard to tell, you know,  
20 looking and say, well, what the adjacent building  
21 influence might be on your particular building.

22 But some of the parts like looking at a  
23 landscaping plan and making sure that there's no  
24 huge trees or shrubs planned for say, like  
25 depending on what kind of a facility you have, if

1       you're on a single story building, making sure  
2       that you don't have a lot of vegetation and so  
3       forth planned for right around the building that  
4       could impact your daylighting opportunities.

5               Next slide. The next one is looking at  
6       the glazing that is being specified for that  
7       particular facility, and making sure that it's  
8       going to give you a reasonable amount of light  
9       input. And this one, in particular, the effective  
10      aperture calculation, that is part of the current  
11      standard. They say that you have to perform these  
12      particular calculations just to see whether your  
13      windows are large enough to qualify or require you  
14      to do some sort of daylighting control.

15             It doesn't necessarily have to be  
16      automatic, but it has to be some form of switching  
17      based on the amount of daylight coming into the  
18      facility.

19             And so calculating the daylit area is  
20      pretty controlled within the specification. It  
21      tells you exactly how to go about doing that, and  
22      figuring out whether you do have an application  
23      that requires daylighting.

24             And next slide. The two last points  
25      that we're looking at making sure that everything

1 is wired up correctly. The biggest problem with a  
2 lighting control system is if it's not even laid  
3 out properly are you going to get the kind of  
4 switching controls that you want.

5 And whether it's manual switching or  
6 automatic switching, making sure that the lights  
7 are wired correctly. That you don't have all the  
8 lights in one area, you know, the lights that are  
9 against the perimeter, the ones that can be  
10 controlled effectively, making sure that those are  
11 wired up to the sensors, and also making sure that  
12 the sensors, themselves, are located in a  
13 reasonable location so that you will achieve the  
14 desired effect.

15 You know, if you have your sensor 30, 40  
16 feet back in from the perimeter you're probably  
17 not going to get that much of a control over your  
18 perimeter fixtures. You want to make sure that  
19 your sensor is a lot closer to the windows, but  
20 then you don't want to try and control the lights  
21 that are 30, 40 feet in. You want to make sure  
22 that you are hooked up to the fixtures that are  
23 just within the area that you really expect to get  
24 the most of the control.

25 Next slide. In construction we want to

1 make sure that the ballasts that are specified  
2 meet the standard requirements. And they  
3 specifically request reduced flicker operation.  
4 And let's see, reduced flicker operation is -- see  
5 if I have it here -- okay, the operation of a  
6 light in which the light has a visual flicker less  
7 than 30 percent for frequency and modulation.

8 So, basically as you start to dim the  
9 ballast down they want to make sure that you don't  
10 have a ballast that's going to start flickering.  
11 Because that can cause annoyances to the occupants  
12 and that would have a tendency to have them  
13 override it, because it's not a very pleasant  
14 situation to be in.

15 So that is currently something that's in  
16 there, but you would just have to look through the  
17 submittals and make sure that they ballast that  
18 they're recommending do comply with that  
19 particular requirement.

20 Another requirement that's in there is  
21 making sure that all of the daylight control  
22 systems do provide some sort of visual and/or  
23 audible signal upon failure. And that can be an  
24 enunciator, it can be some sort of an illuminated  
25 panel or something that lets you know that if

1 something has failed, that it has failed.

2 Next slide. Okay, if we're looking at  
3 switching they do have requirements in there as  
4 far as a dead band, making sure that you don't  
5 short cycle your particular application. And for  
6 automatic we're talking about a three-minute  
7 delay. So that if you have a cloud that comes by  
8 and the light sensor says, well, I'm not going  
9 to -- or if the light sensor does respond to that  
10 cloud, and the lights come up, as soon as that  
11 cloud goes away you're not going to automatically  
12 go back. There is going to be a delay in there.  
13 And the current requirement is three minutes to  
14 make sure that you don't short-cycle the ballast.

15 And it's another thing that can cause  
16 comfort and occupant complaints. Because if they  
17 notice the lights doing something, someone's going  
18 to think there's something wrong with them. The  
19 best is to have them not even notice that anything  
20 is really going on.

21 And all the control devices, the photo  
22 cells, have been properly located and calibrated.  
23 And that the appropriate set points and threshold  
24 levels have been set.

25 Okay, next slide. And as far as testing

1 something like this, you know, it's pretty simple.

2 One, you want to simulate a bright condition.

3 That can be either, you know, opening up all the

4 shades around, if you have vertical shading.

5 Making sure that all the shades are in the up

6 position on a sunny day.

7           You can also, you know, take like a  
8 flashlight to try and trick the photo sensor into  
9 thinking there's adequate light. And the one  
10 requirement that they have for all daylighting  
11 controls, whether it be automatic or manual, is  
12 that you achieve a 50 percent reduction in power  
13 under a fully dimmed condition.

14           Now, that can mean you can have  
15 individual lamps within a fixture. If you have,  
16 say, a two-lamp fixture, if one of the two lamps  
17 goes completely off, that would qualify.

18           You can have both of them dim down.  
19 It's a wide variety of combinations that can be in  
20 there. But it does require that it be reduced to  
21 50 percent.

22           And if you have an automatic system you  
23 can do it by actually measuring, you know, putting  
24 a current transformer onto a circuit and measuring  
25 it, making the ballast go as far down as it can go

1 and measuring the current and see what the power  
2 draw is on that ballast.

3 But this is one of the measures that  
4 we're shooting for, is it has to be 50 percent.

5 And also the other thing on an automatic  
6 daylighting control making sure that the amount of  
7 light that's being reduced is uniform. You know,  
8 we don't want to have dark spots and light spots,  
9 because that's going to just incite a comfort sort  
10 of complaint, and someone's going to think there's  
11 something wrong. And so the chances of them  
12 overriding that system are a lot greater.

13 Next slide. Next thing that we're  
14 looking at under a fully dimmed condition is  
15 making sure that that reduced flicker is also  
16 accounted for. That when you watch the lamps dim  
17 down and go to the various points, just make sure  
18 that it doesn't flicker. Because that is going to  
19 be a problem and cause them to be overridden. And  
20 it just requires that, you know, if the ballast  
21 manufacturer has it in there that the 30 percent,  
22 I'm not sure how you would technically test for  
23 that 30 percent flicker, but I think a lot of that  
24 is just visual. If you see something going on  
25 it's probably not adequate.



1           And next slide is going in the complete  
2       opposite, going to simulating a dark condition.  
3       And making sure basically that the whole system  
4       comes back up. That you have a uniform increase  
5       in light; making sure that you come back up to  
6       full power, and that you -- and the other big one  
7       is the flicker there, again, that you don't have  
8       anywhere in between fully dimmed to fully  
9       illuminated that you don't have any visible  
10      flicker going on.

11           And that's basically about it.

12           MR. ALCORN: Okay, Larry, if I could  
13      interrupt for just a moment, before we go into the  
14      questions and answers, I'd like to see if it would  
15      be okay to turn the PowerPoint presentation off  
16      because we're expecting Don Felts, the next  
17      presenter, to call in and we need to have the  
18      PowerPoint presentation off for that.

19           MR. LUSKAY: Okay. Yeah, that was the  
20      last of it.

21           MR. ALCORN: Great, okay, so we've got  
22      five minutes before we will take the call from  
23      Don.

24           MR. ELEY: I have a question. Charles  
25      Eley, Eley Associates. Some of these criteria

1       that you just reviewed, like uniformity and  
2       flicker and so forth, they're not really code  
3       requirements.

4               So what happens if flicker is observed,  
5       or if nonuniform conditions are observed?  What  
6       remedy, how do you correct those?  What happens at  
7       that point?

8               MR. LUSKAY:  Well, the visual flicker  
9       requirement is in there.  It says that -- that's  
10      exactly what it says, that the operation of a  
11      light in which the light has a visual flicker less  
12      than 30 percent in frequency modulation, that's in  
13      there saying that you have to have that particular  
14      equipment in order to achieve that.

15              MR. ELEY:  What about uniformity?

16              MR. LUSKAY:  I think, you know, what  
17      we're trying to do there is we're trying to make  
18      it as unobtrusive as possible.  Uniformity is a  
19      little more --

20              MR. ELEY:  Okay, well, Jeff showed --

21              MR. LUSKAY:  -- subjective, it is more  
22      subjective.

23              MR. ELEY:  So is flicker, I guess.

24              (Laughter.)

25              MR. GILLESPIE:  Well, without a test

1 method it is.

2 MR. JOHNSON: Just as a comment, one of  
3 the things is that this is if you install  
4 daylighting controls for credits. Remember, this  
5 is a case where someone is increasing their  
6 lighting power density because they're installing  
7 daylighting controls.

8 MR. ELEY: Right.

9 MR. JOHNSON: Okay. Doesn't prevent  
10 someone from installing daylighting controls  
11 without, you know, anything else. But this is  
12 specifically for those who are getting credit.

13 MR. LUSKAY: True. The daylighting  
14 would still be a requirement if there's adequate  
15 light coming into the space. Daylighting control  
16 is required. It doesn't stipulate how.

17 The manual control is most likely going  
18 to take precedence, but you can apply for a credit  
19 if you want to do some form of automatic dimming  
20 control. But daylighting is required if adequate  
21 light is available.

22 Ken, you had a question?

23 MR. GILLESPIE: Ken Gillespie, PG&E.  
24 I'm just concerned about your comment that you  
25 don't have a test method. I think you open

1       yourself up for, you know, it's like how do you  
2       enforce the code if you don't have a conceivable  
3       way to test this?

4               Seems like a moot point to have it in  
5       the code if you can't test it.

6               MR. ALCORN:   John.

7               MR. HOGAN:   John Hogan, City of Seattle.

8       Yeah, I just wanted to follow up with Ken here.  I  
9       think when you start to come up with the  
10      procedures to figure out how you're going to  
11      verify this, it makes some suggestions where you  
12      could improve the code language that you've got.

13              I think in Seattle we have a similar  
14      language here, and what we're doing is essentially  
15      use the flashlight with a focus beam or something  
16      so you can check and make sure the dimming  
17      controls work or don't work.

18              We don't have any flicker control that  
19      we're checking.  We're not checking uniformity.  
20      But the issue about you talk about where the  
21      sensor is placed, I think there could be more  
22      guidance provided to that.  You know, if  
23      California is moving from a place where this has  
24      been an optional credit to where it would not be  
25      an optional credit, but may be required in certain

1       circumstances. You know, if you start moving in  
2       that direction, I think it's a good idea to start  
3       thinking about where does the sensor go. Should  
4       there be two sets of sensors, you know, if you got  
5       two rows of lamps within 15 feet of the window,  
6       should there be one on the first row and another  
7       one on the second row.

8               Because it makes a big difference if you  
9       set it on the first row or you set it on the  
10      second row, you're going to get a big difference  
11      in the lighting energy savings.

12             And in particular, once you start doing  
13      that, of course, you're going to get away from  
14      uniformity in a certain way, you know. It's  
15      uniformity along this row, and then a slightly  
16      different uniformity on the second row.

17             MR. ALCORN: Tom.

18             MR. TRIMBERGER: Yeah, I echo what was  
19      said as far as having a standard, you know. Is  
20      reduced flicker, does that mean it doesn't flicker  
21      at all, you know. Some of this is really  
22      subjective.

23             Also I'm trying to get a handle on a  
24      couple of things. So this is only required if you  
25      have automatic daylight controls, then you would

1 have it tested by the installer, or by a third  
2 party?

3 MR. JOHNSON: This would be tested by  
4 the installer, again. This is a --

5 MR. TRIMBERGER: Okay, so right now  
6 they --

7 MR. JOHNSON: Actually, let me clarify  
8 what --

9 MR. TRIMBERGER: -- can get credit for  
10 it, but they don't have to have any self  
11 certification.

12 MR. JOHNSON: Correct.

13 MR. TRIMBERGER: This would just take it  
14 another step.

15 MR. JOHNSON: Yeah, and actually let me  
16 clarify a couple things. Sections 110 through 119  
17 in the standard almost -- I mean they're basically  
18 that section applies to the manufacturer. So, in  
19 many cases the manufacturer could provide  
20 certification to an installing contractor that the  
21 devices meet these requirements. They don't cause  
22 flicker, things like that.

23 So one thing that could happen here is  
24 that the installer, on the installation  
25 certificate, the installer could -- currently

1       there's supposed to be an installation certificate  
2       filled out for these devices.

3               Okay, and that installation certificate  
4       is supposed to state that it meets all these  
5       requirements, like reduced flicker, uniform  
6       reduction and all that.

7               So, it's an existing requirement. What  
8       we're saying is we're asking the contractor to  
9       verify that all happened and that we're signing  
10      that.

11              So, part of the challenge is that we're  
12      sort of taking these obscure requirements and  
13      bringing them up to the forefront, and we're  
14      going, whoa, what does that mean, oh, my gosh.  
15      But they've been there for ten years. And kind of  
16      ignored.

17              And so I think part of the challenge is  
18      to get that spotlight to the certificate of  
19      acceptance on these requirements and get people to  
20      actually think about them and try and follow them.

21              MR. TRIMBERGER: Is there any record or  
22      any understanding how often are automatic daylight  
23      controls used? Is there a percentage? Does  
24      anybody have a handle for how low that number is?

25              MR. JOHNSON: It's actually increasing.

1 It's up to, I believe, 10 to 12 percent of floor  
2 area, something like that. It's gotten pretty  
3 high. I'm quoting a number, I have the number.  
4 It was actually in a study that was done by PG&E  
5 last year on automatic lighting controls for the  
6 AB-970 process. And it showed market penetrations  
7 of daylighting controls in the State of  
8 California. It's going up.

9 For credit, I'm not sure. A lot of  
10 people just do it without taking the credit; it  
11 happens a lot in schools, which is -- basically  
12 the inspection process is very different for  
13 schools.

14 MR. TRIMBERGER: Yeah, we only do  
15 private schools. Yes, part of, you know, 10 to 12  
16 percent seems a lot higher than what I would have  
17 guessed. And my experience with people who have  
18 done it, haven't really liked it. And it may be  
19 because they haven't commissioned it properly,  
20 things like that.

21 So I think there's a lot of hesitance in  
22 the industry, and I don't know if this would  
23 perhaps help that by making it a little harder to  
24 do.

25 MR. LUSKAY: Well, a lot of it is tied



1 up more in design, and if you didn't have a good  
2 design to begin with, or a good layout, the  
3 chances of success later on are less.

4 And so in this particular instance, if,  
5 you really need to put more emphasis up front than  
6 on the back-end equipment, you know, laying out  
7 the system. Where are you going to put the  
8 sensors, like John was mentioning. If you have  
9 two rows do you control both of those rows off of  
10 one; do you have independent; you know, how is the  
11 circuiting going to go, things like that.

12 That really makes or breaks one of these  
13 systems as far as, you know, comfort and actual  
14 energy savings and so forth. So it's hard to  
15 mandate proper design, but that's where you need  
16 to really focus on a daylighting, and automatic  
17 daylighting control system in particular.

18 Yes, Ken.

19 MR. GILLESPIE: I would just offer that  
20 daylighting design systems is one of the chief  
21 design assistance activities that takes place at  
22 the Pacific Energy Center with the Heliodon model  
23 that they have. This is where they spend a lot of  
24 their time is helping architects design good  
25 daylighting buildings.

1           So it's become a very important energy  
2       efficient opportunity. In fact, utility public  
3       good programs tend to favor it. So, I mean that's  
4       one reason why it is increasing is more focus has  
5       been placed on it.

6           The problem is technology, this is one  
7       area where technology has kind of lagged in better  
8       sensors and better design of placement of those  
9       sensors.

10          MR. ALCORN: Okay. Tony, you have one  
11       final --

12          MR. PIERCE: Yeah, sure. Tony Pierce  
13       with Southern California Edison. I'm just kind of  
14       parroting, I think, what Larry and Ken were just  
15       saying. The design, as we've done some showcases  
16       for daylighting control, in your language, I  
17       guess, I'm not sure how literal you're planning to  
18       put this into the recommendation for say, a  
19       certificate of acceptance, but all automatic  
20       control devices are located appropriately.

21          Well, what is appropriately? I mean  
22       we've done projects where we've installed them  
23       with the manufacturer present per their guidelines  
24       and it doesn't work. And we go through all these  
25       iterations. So, I mean a little more definition

1 of appropriate.

2 And then when you talk about design,  
3 when you look at the design community and the  
4 electrical engineers that are laying out the  
5 systems, they're designing to an LPD. So when you  
6 go out to calibrate a daylighting control with a  
7 light meter, and now you're measuring footcandles,  
8 and you say, is this right. Well, what's the  
9 basis of design. Well, the basis of design is an  
10 LPD.

11 And then when you go look at IES and IES  
12 gives you a range in footcandles that say 30, 50,  
13 70 fc for a three-foot desktop or whatever, well,  
14 you know, one, the electrical engineer of record  
15 may not have even specified which of those is  
16 required. So you don't have a basis for a light  
17 level. And two, IES is changing those.

18 So, I guess just that's food for  
19 thought, you know, on the two points. Are we  
20 going to then specify basis of design, which might  
21 be a good way to go. It's probably going to throw  
22 a wrench in a lot of the design community who has  
23 no experience designing for light level.

24 MR. JOHNSON: That's a really good  
25 point, and I think these are the kinds of things

1 we need to think about in terms of both the  
2 existing standard requirements of the acceptance  
3 process, and how to help make sure that what's in  
4 the standards and what we're doing here supports  
5 what's going on, as at Pacific Gas and Electric  
6 Company and other places where -- San Diego and,  
7 you know, the other utilities are out promoting  
8 daylighting actively. Including CHPS is promoting  
9 it.

10 How do we make sure that that's all in  
11 synch so that when these systems are installed  
12 this stuff all follows along.

13 So, a good point.

14 MR. AHMED: The problem is daylighting  
15 is not an exact science. It has several elements  
16 interacting. The lighting system with the  
17 architecture of the building; the shape of the  
18 roof or the skylights, et cetera.

19 So I think if you were to require  
20 certain uniformity or flicker requirements when  
21 the design, itself, is flawed I don't know how you  
22 can handle that.

23 MR. JOHNSON: I'd agree, but I'd also  
24 point out that there's a fairly healthy credit  
25 that's offered, up to 40 percent of the -- and

1       that if it's not -- and this is really the issue,  
2       is if you're taking that credit, you should be  
3       required to prove that your controls are working  
4       when you walk off the job.

5               Otherwise, if we want to treat it as an  
6       art, then let's not give it a credit. It's sort  
7       of a thing, gosh, okay, we're saying we're going  
8       to do this. I mean the challenge is that this  
9       usually credit doesn't happen in lighting. If we  
10      do it in a simulation you take the lighting credit  
11      and you go take insulation out of the building and  
12      put in a less efficient system.

13             MR. AHMED: It's traded off, yes.

14             MR. JOHNSON: Use it as a tradeoff. And  
15      that's, I think, where, you know, it's a  
16      challenge, because, you know, people are going to  
17      play with it. So it's like, okay, let's --

18             MR. AHMED: I think, Jeff, you know even  
19      in DOE there's only, I think, two or three simple  
20      daylighting models.

21             MR. JOHNSON: Yes.

22             MR. AHMED: And in reality there's so  
23      many different configurations in the buildings.  
24      And DOE reduces them down to only I think two of  
25      them. Some sort of an atrium versus tromb wall or

1 something it's called, I forgot.

2 MR. JOHNSON: Well, no, there's actually  
3 a number of ways you can simulate and get the  
4 results out of that, but it also assumes very good  
5 control operation, things like that. And so,  
6 yeah, if you describe the space properly you can  
7 do some pretty -- quite a few configurations.  
8 Atrium and other things -- be a little more  
9 difficult.

10 MR. AHMED: Yeah.

11 MR. ALCORN: One last question.

12 MR. PIERCE: Yeah, Tony Pierce again, a  
13 follow up to your comment, Jeff. I agree  
14 completely we don't want to have a daylighting  
15 credit. We don't recommend it be as a tradeoff,  
16 we're trying to go beyond the code.

17 But, the problem, I guess, or that I  
18 foresee maybe is that with a contractor having to  
19 sign the certificate where he has no control. The  
20 comments that Ahmed made are exactly right. The  
21 physical dimensions, how the light bounces off the  
22 ceiling, what the reflectance is of those interior  
23 finish materials are, I don't know how we -- you  
24 know, the contractor can't sign that because they  
25 don't work. You know, are we going to go out and

1 say does it reduce by 50 percent the light power  
2 density. No. Does that hold up final CofO?

3 So, I don't know, we need to figure that  
4 out, I think, a little more.

5 MR. JOHNSON: Yeah, that's a good point.

6 MR. ALCORN: Okay, looks like we have  
7 some more comments on this topic. Can we take one  
8 more and then maybe we can hold comments on this  
9 subject until the last part of the meeting called  
10 closing comments. Because we have Don Felts  
11 patiently waiting to make his presentation.

12 MR. HOGAN: One quick observation. It  
13 sounds to me we're starting to talk about things  
14 that are beyond what are in the code language, you  
15 know, to make the design work you need the  
16 footcandle specifications. The code doesn't  
17 necessarily require that. It requires that the  
18 sensor work. You want to make sure the sensor is  
19 connected to the control, and regardless of what  
20 footcandle level we set it for, it works.

21 And I think that's different from some  
22 of the HVAC that we're talking about where the  
23 code is actually talking about this amount of air  
24 coming through, this amount of outside air.

25 So, in some cases the code is very

1 specific about design requirements; in other  
2 cases, it doesn't go into that amount of detail.  
3 I guess the question of how far we want to go into  
4 places where the code doesn't regulate right now.

5 MR. ALCORN: Thank you, John.

6 MR. JOHNSON: Okay, I think we're ready  
7 to move on to the next presentation. Don Felts,  
8 are you still on the line with us?

9 Did we lose Don?

10 (Laughter.)

11 (Off the record.)

12 MR. ALCORN: Don, this is Bryan Alcorn.

13 MR. FELTS: Hi, Bryan.

14 MR. ALCORN: Hi. We have everyone here;  
15 we're sorry for the delay. I guess we lost you  
16 somehow.

17 MR. FELTS: -- now I'm back.

18 MR. ALCORN: Okay, terrific. Well,  
19 we're ready for your presentation.

20 MR. JOHNSON: Yeah, Don, this is Jeff  
21 Johnson, hi.

22 MR. FELTS: Hi --

23 MR. JOHNSON: Did good. I thought what  
24 we'd do in the essence of time is we wanted you to  
25 run through the acceptance process. And we've



1 given a couple of examples of the test  
2 requirements here. We thought we'd get into the  
3 process side of things at this point, if that's  
4 all right.

5 MR. FELTS: Yes, I'm ready to go.

6 MR. JOHNSON: Thanks.

7 MR. FELTS: So, basically what we've  
8 done in thinking about the acceptance process is  
9 examine who is available to undertake this, and  
10 essentially we would do this as a third-party  
11 provider independent of the building owners and  
12 contractors.

13 Then it became apparent that there was -  
14 - work in the building that in many ways  
15 duplicated the work that we were considering, and  
16 we have specified to be done under the acceptance  
17 testing process.

18 And it became fairly clear that this was  
19 going to be a very extensive process, and perhaps  
20 a very controversial process for building owners.

21 So we are looking in talking with others  
22 in the community about ways that we can simplify  
23 this process.

24 Now, as you know, the building owner and  
25 his contractor are responsible for all the testing

1 and balancing, this is slide 32. The first slide  
2 of the acceptance process. And there was  
3 basically four loops of people who -- typically  
4 with the building owner. That's the architect,  
5 engineers, the commissioning agent, mechanical and  
6 electrical contractors, test and balance  
7 contractor, -- capabilities that could, indeed  
8 should undertake these acceptance testing process.

9 And out of the -- the commissioning  
10 agents are the most highly qualified, of course.  
11 We all know that the State of California and  
12 elsewhere there would never be enough  
13 commissioning agents to take the responsibility  
14 for this work; and there just aren't enough  
15 commissioning agents available.

16 Other than that the mechanical/  
17 electrical engineers would certainly be capable,  
18 but then it's probably interference with -- since  
19 they do other things that are much more important  
20 than the acceptance testing.

21 And with the mechanical/electrical  
22 contractors, test and balance contractors are  
23 again have levels of qualification to undertake  
24 this work. And the test and balance contractor,  
25 as you probably all know, usually only present on

1 the larger projects. On the smaller projects it's  
2 usually going to be mechanical contractors that  
3 does the test and balance process.

4 So, all of these contractors are not  
5 available to all projects, and many cases where  
6 there would be several different groups of people  
7 that would be undertaking this work.

8 And I think the really good thing about  
9 what we have in mind here is I think it will be  
10 fostering an increase in the number of  
11 commissioning agents out there. Because on the  
12 more sophisticated buildings, mechanical  
13 contractors, mechanical engineers are not going to  
14 be wanting to take the responsibility for the  
15 acceptance testing, they are going to want the  
16 expert commissioning agents to come in.

17 With that, slide number 32, the  
18 contractors -- contractor relationship in light of  
19 the responsibility. Again, the test and balance,  
20 it's either directly coincide with the acceptance  
21 testing, and we feel it's very important to take  
22 advantage of this contractual and licensing  
23 synergies in implementing the acceptance process.

24 Next slide, please. And given the  
25 economic contractual and licensing synergies we

1 feel it follows that contractors will be the ones  
2 responsible for providing instrumentation,  
3 measurements, and other things undertaking all of  
4 the acceptance process procedures.

5 And we feel that this is a judicious  
6 deviation from the original path that we were  
7 thinking about, and that the commission wanted to  
8 take, to have a third-party responsible for the  
9 acceptance process.

10 Next slide, please. So therefor the  
11 owner and his contractors will be responsible for  
12 basically documenting the results of the  
13 acceptance requirement procedures; and that  
14 outline that Larry and Jeff have talked about.

15 And then performing the data analysis,  
16 calculation of performance indices and cross-  
17 checking the results with the requirements of the  
18 standards, and recording this information and  
19 making it a part of the project documentation  
20 that's passed on with the certificate of  
21 acceptance to the code enforcement agency.

22 Next slide. Contractors will again, if  
23 the test indicates, the systems that are under  
24 consideration are not performing in compliance  
25 with the standards, then they will, of course, be

1 responsible for correcting any performance  
2 deficiencies and re-implementing the acceptance  
3 process.

4 Then upon the satisfactory completion of  
5 the acceptance process they will be responsible  
6 for reviewing the certificate of completion,  
7 authorizing the release of the certificate of  
8 occupancy.

9 And, again, the key thing that we're  
10 relying on here to make sure that this is done, is  
11 their responsibilities as registered -- licensed  
12 contractors to do the work in accordance with  
13 their contract, and in accordance with the laws  
14 and regulations that govern their process.

15 And then there are definitely -- now, as  
16 a quality control and quality assurance backup  
17 we've all felt, and I believe the Commission would  
18 like to have an independent third party  
19 performance verification agent to be able to come  
20 in and check on a selective basis whether or not  
21 the acceptance standards are indeed being  
22 implemented in accordance with the standards.

23 So this independent third-party agent  
24 will be -- of all projects that have been through  
25 the acceptance process, and will be responsible

1 for selecting the sample of building projects  
2 where the acceptance certificates have been  
3 issued.

4 Then the person will be responsible for  
5 performing follow-up quality assurance and quality  
6 control spot tests of the acceptance procedures.

7 Now, they'll be responsible for having  
8 their own instruments; their own calculations and  
9 so forth. And verifying, on a spot-test basis,  
10 randomly in selected buildings that the work has  
11 been done in accordance with the standards. They  
12 will compare their results with the results of the  
13 building owner/contractor.

14 And next slide, please. You need to  
15 limit these in the result. Outside of a -- minor  
16 range, will be first of all reporting to the  
17 building owner and it will be up to the building  
18 owner to take action to have these discrepancies  
19 corrected. The discrepancies will and should be  
20 posted in a acceptance process public record so  
21 that there's a public record showing that a  
22 contractor who has -- have a persistent record of  
23 noncompliance with the standards.

24 And then another aspect is the report to  
25 the respective licensing agencies for professional

1 engineers, architects or contractors undertaking  
2 the work, that indeed this contractor is not in  
3 compliance with the standards.

4 Now, it's not clear what kind of impacts  
5 that will have, but as we all know, there are  
6 important enforcement provisions of all the  
7 registration and licensing standards.

8 MR. JOHNSON: Don?

9 MR. FELTS: Yes.

10 MR. JOHNSON: Excuse me, this is Jeff  
11 for a moment. I just want to point out to the  
12 group something that, one of the issues that we  
13 were looking at is would there be a way to do some  
14 spot checking of this acceptance process.

15 The current proposal does not outline  
16 the third-party verification process that Don's  
17 mentioning. This is has been something that was  
18 under discussion, but because of likely of the  
19 cost issues associated with it, and other things,  
20 as well, plus the lines of authority of the  
21 Commission, we're still entertaining ideas for how  
22 we might do spot checking and sort of monitor this  
23 acceptance testing process.

24 So, with that, Don, I'll let you go  
25 ahead and continue. I just wanted to give people

1 some context here.

2 MR. FELTS: Okay. One thing that I  
3 really want to point out that the spot checking  
4 that's going on, if we use it correctly it will be  
5 a tremendous background of knowledge about how  
6 systems are performing, and how contractors are  
7 implementing this performance, the acceptance  
8 process.

9 And I think that's going to be our  
10 responsibility to make sure that information is  
11 compiled and used as we go forward and -- changes  
12 to the code.

13 But, before the third-party performance  
14 verification there are several huge issues that I  
15 believe we're going to need to address -- and try  
16 to think the big element is a mechanism to prevent  
17 any kind of performance -- third-party agent.  
18 There is no mechanism in place that we can go back  
19 and make sure that these deficiencies are  
20 corrected.

21 At this point the building is occupied;  
22 contractor's likely paid for his work. Maybe a  
23 retention for the warranty period, but it's  
24 probably not the entire retention amount. So  
25 there's not that financial element that the owner



1       can use as a leverage to make sure this work is  
2       done.

3               And so -- I believe that they're very  
4       worthy of discussion by this group, and further  
5       consideration.

6               And that's my presentation and I'm open  
7       to questions, as I'm sure Jeff is. Thank you.

8               MR. ALCORN: Thank you, Don. We have a  
9       question from Ken Gillespie.

10              MR. GILLESPIE: Are we interested in  
11      talking about this independent third party, or is  
12      that something you want to leave off the table,  
13      Jeff?

14              MR. PENNINGTON: At this point it's not  
15      proposed in the standard. And --

16              MR. GILLESPIE: Just trying to find out  
17      if you want to spend the time talking about some  
18      issues associated with it.

19              MR. PENNINGTON: The only way that I can  
20      see it being done is as a sort of a research type  
21      of project where there was some checking on the  
22      acceptance testing process to see if it was  
23      working. And I really think that that is going to  
24      be an important thing to do. I think we ought to  
25      try to figure out how to fund that.

1           You know, the Commission was very much  
2           interested in a third-party verification process.  
3           And we basically bought into the idea of giving  
4           this acceptance testing process an opportunity to  
5           see if that would work.

6           But, you know, if it doesn't then we  
7           still have substantial problems with the  
8           installation of these kinds of equipment that  
9           needs to be addressed.

10          MR. GILLESPIE: If we go down that path  
11          there's some fundamental issues typically in a  
12          commissioning activity, there's actually the  
13          importance of using the same instrumentation, not  
14          using different instrumentation.

15          And if you bring in a third party with  
16          different instrumentation you've brought a new  
17          uncertainty into the whole process. And you have  
18          to then come up with criteria by which you define  
19          how good that instrumentation has to be, how good  
20          that data has to be.

21          I mean it's a whole other -- to compare  
22          data you've got to do the scientific discipline of  
23          defining how good that data has to be.

24          I just want to bring that up because it  
25          adds a level of complexity most people don't even

1 pay attention to.

2 MR. FELTS: That's true, but we are  
3 giving a range of error, plus or minus 10 percent.  
4 And if we're using calibrated instruments the  
5 operator will be in that range of error.

6 The thing I want to point out with the  
7 third party, if we had all the work done by a  
8 third-party agent instead of a building owner/  
9 contractor, we have very significantly added to  
10 the cost of a project. And we're duplicating work  
11 that's already being done. That will be very  
12 controversial in my opinion.

13 Because you take a look at what  
14 commissioning costs for instance on a project.  
15 It's a significant -- any comments?

16 MR. ALCORN: Tony Pierce.

17 MR. PIERCE: Yeah, hi, Don, Tony Pierce  
18 with Edison. I had a simple one. I'm not sure if  
19 I missed something. On slide 35, your slide 35 in  
20 the last sentence it says, upon satisfactory  
21 completion of the acceptance process issuing a  
22 certificate of completion authorizing the release  
23 of a certificate of occupancy.

24 We've been talking about today a  
25 certificate of compliance during the design or

1 construction phase and then a certificate of  
2 acceptance. Is the certificate of completion just  
3 a new --

4 MR. FELTS: No, no, I perhaps put the  
5 wrong word down. Jeff could discuss better, I  
6 mean, because I'm not modifying any of the  
7 proposal.

8 MR. PIERCE: Okay, so that would be the  
9 certificate of acceptance?

10 MR. JOHNSON: Yeah, I think at one point  
11 in an earlier draft those two terms were used, and  
12 we've settled on certificate of acceptance.

13 MR. FELTS: Then certificate of  
14 acceptance should have been in my presentation.

15 MR. JOHNSON: Along with the caveat that  
16 Tom brought up earlier, that final versus  
17 temporary, and that that be delineated.

18 MR. ALCORN: Okay, are there any other  
19 questions or comments for Don? It appears not.  
20 Don, thank you very much.

21 MR. FELTS: I will remain on line so I  
22 can hear the rest of the meeting.

23 MR. ALCORN: Terrific. I guess, Jeff,  
24 could you clarify something for me. Is the  
25 acceptance process, Don's doing that one next --

1 MR. JOHNSON: We just --

2 MR. ALCORN: We got through that one.

3 MR. JOHNSON: We didn't do the  
4 economizer piece, no. We skipped that example  
5 just in the essence of time. Unless people would  
6 like to run through another piece here.

7 MR. ALCORN: Okay, I'm seeing some  
8 negatives. Would anyone here like to hear an  
9 example of the economizer? Economizer example?  
10 I don't think --

11 MR. ELEY: It's in your write-up,  
12 though, right?

13 MR. ALCORN: Yes, it is.

14 MR. AHMED: It's in the write-up --

15 MR. ALCORN: Okay, terrific. All right,  
16 Don, thank you very much. It looks like we're --  
17 are there any closing comments, any questions on  
18 any of the previous presentations, any general  
19 comments, questions?

20 MR. AHMED: Yes. Can tomorrow's meeting  
21 be as short as this?

22 (Laughter.)

23 MR. ALCORN: No.

24 (Laughter.)

25 MR. BURT: I don't think we really

1 resolved the issue that was raised earlier by --  
2 that there's going to be an intense desire to  
3 occupy, even though you have not necessarily  
4 completed all aspects of the acceptance process.

5 And I don't know a simple answer, but I  
6 suggest that the local official ought to be able  
7 to decide whether the building is satisfactory for  
8 occupancy even though the whole acceptance process  
9 is not completed.

10 I hate to see some requirement that you  
11 have to come back to Sacramento in order to get  
12 any certificate of occupancy even though you've  
13 not fully complied with the acceptance process.

14 I've been in this business, and I've  
15 seen where the final process of getting a building  
16 completed is sometimes very lengthy for a lousy  
17 small amount of work. And I'd hate to see what is  
18 fundamentally a sound concept creating a great  
19 deal of unnecessary conflict and public acrimony  
20 when I think it can be avoided by giving the local  
21 official a right to say, well, we'll give you a  
22 certificate, for the lack of a better word, of  
23 temporary occupancy while we await the completion  
24 of the process.

25 MR. JOHNSON: Just a comment. Tom, one

1 of the things that we had put in the draft  
2 proposed language was -- shall point this out --  
3 on page 9 under the definition, or essentially the  
4 section we're going to add, 10-103(b), it states,  
5 for all new buildings designated to allow a  
6 conditioned use of an occupancy group or type  
7 regulated by part 6, the applicant shall file  
8 certificate - plural - certificates of acceptance  
9 prior to receiving a final occupancy permit.

10 And that was at the top of page 9; it's  
11 part 3(b) certificate of acceptance.

12 We then went ahead and under each of the  
13 sections starting on page 10, we put in before an  
14 occupancy permit is granted. What if we just  
15 change that to a final occupancy permit?

16 MR. TRIMBERGER: Yeah, I'd encourage  
17 that real strongly. I brought up the point of  
18 temporary occupancy just to kind of emphasize  
19 that, you know, at this point building officials  
20 juggling a lot of balls in the air.

21 We've got, you know, minor stuff, we've  
22 got some accessibility issues; we've got some  
23 parking issues that still haven't been resolved.  
24 The fire marshal hasn't signed off. You know,  
25 these are things we've got to make sure we can do

1 before we can do that final.

2 And we use an enormous amount, and  
3 sometimes too much, creativity to get people into  
4 buildings, you know. It's something we do, you  
5 know. We can -- maybe we don't have a fire  
6 sprinkler system up and running, but guess what,  
7 they got to be in. Or they've got something  
8 really extreme.

9 Well, you know, if it's a short amount  
10 of time we can do it with a fire watch, have, you  
11 know, one or more people on duty, and their job is  
12 to walk around and hold the phone to the fire  
13 department and watch for fires.

14 So that's -- I didn't bring that up to  
15 say that a temporary certificate of occupancy  
16 would be difficult. I'm just saying this is a  
17 really really critical time in this operation of  
18 somebody paying the bills, getting something  
19 built, and moved in.

20 They've advertised their grand opening,  
21 or they've got their big event planned, or they've  
22 got students showing up on Monday morning, and  
23 they've got to be in. And that's exactly the time  
24 that building officials and designers and builders  
25 don't want to have another thing, another ball to



1 keep up in the air. It makes things more  
2 difficult.

3 MR. PENNINGTON: I have a question, Tom.  
4 I'm sort of wondering how this process normally  
5 works. Is there an actual document that is a  
6 temporary certificate of occupancy that you issue?

7 MR. TRIMBERGER: I'm sure this would  
8 vary from place to place, but for us, no. It's an  
9 application and \$1000 deposit saying, you know, we  
10 want to do this and these are the conditions.

11 So, sometimes we'll write up some  
12 conditions on it. It can be verbal, it can be  
13 written, it can be both.

14 MR. PENNINGTON: Is this in the building  
15 code somewhere, that this is authorized or this is  
16 done? I'm not trying to --

17 MR. TRIMBERGER: I don't know. I don't  
18 know. We do it.

19 MR. PENNINGTON: Yeah, it might be  
20 useful to us to reference a particular section if  
21 this is covered somewhere.

22 MR. TRIMBERGER: Yeah, maybe I can do a  
23 little research for you on that.

24 MR. PIERCE: I have a related question,  
25 too. I notice some jurisdictions in southern

1 California call it certificate of beneficial use  
2 or beneficial occupancy, as opposed to temporary.  
3 It may just be semantics, but I don't know how  
4 formal it is, whether it's an actual certificate  
5 or application.

6 MR. PENNINGTON: Do you end up in  
7 situations where they just don't bother to get the  
8 final after that? Basically that, you know, their  
9 job is done from their vantage point?

10 MR. TRIMBERGER: Yes.

11 MR. PENNINGTON: So is that something we  
12 should be concerned about?

13 MR. TRIMBERGER: Yes.

14 (Laughter.)

15 MR. ALCORN: John.

16 MR. TRIMBERGER: Actually, no. You  
17 know, when we're trying to button up a project and  
18 getting everything finished, there probably are  
19 higher priorities than energy details that maybe  
20 are more important to the occupant, the builder  
21 and the building official.

22 Does it happen that sometimes they just  
23 don't get it done? Well, occasionally, but then  
24 what happens is the temporary certificate of  
25 occupancy, it's only good for typically 30 days.

1 After 30 days they can reapply, or they can lose  
2 their deposit, and we go write them up and cite  
3 them for not getting their permit done.

4 MR. HOGAN: John Hogan, City of Seattle.

5 I would say that the issue of people not getting  
6 final is probably smaller buildings. Because I  
7 think, as you mentioned earlier, Tom, people have  
8 financing, all sorts of other stuff before people  
9 sign off on things, other parties, they want to  
10 make sure this is legal and it's done correctly,  
11 so I don't think this is a concern for big  
12 buildings. It's more for the smaller projects.

13 I think by addressing this issue of  
14 temporary versus final, I think that takes care of  
15 a lot of the concerns. But, in terms of providing  
16 flexibility, I think that's the place to provide  
17 the flexibility.

18 As Tom has just indicated, building  
19 officials get pushed on a lot of different things,  
20 in a lot of different places.

21 I would recommend that the code be as  
22 clear and as specific as possible so that  
23 everybody knows what the rules are and you don't  
24 have one contractor playing you off against  
25 another contractor or something.

1           So, don't leave it too wide open. Maybe  
2           some flexibility in terms of what's done temporary  
3           or final, but let's have the rules clear so  
4           everybody's playing by the same rules.

5           MR. TRIMBERGER: I think the language  
6           that Jeff mentioned on the top of page 9, that if  
7           we look at, you know, changing whenever you say  
8           occupancy permit, put final occupancy. I think  
9           that's pretty clear. And it gives building  
10          officials all the direction they'll need.

11          MR. ALCORN: Ken.

12          MR. GILLESPIE: If I could change the  
13          topic just slightly. I'd like to speak to the  
14          idea of getting commissioning in the code, or  
15          aspects of commissioning into the code.

16                 I think that one of the things that  
17          comes up every time I think about this is that  
18          everybody has a different idea of what  
19          commissioning is when we talk about it. So our  
20          reference frames are altered and we don't really  
21          know what each other's talking about.

22                 And so I highly recommend, and I would  
23          recommend privately that anytime you talk about  
24          some aspect of it, you speak specifically to the  
25          aspect. Kind of leave commissioning out of the

1 conversation. So, if it's an acceptance activity,  
2 if it's a testing activity, call it that.

3 But I would like to see certain aspects  
4 of the commissioning process find its way into  
5 code. And I think given the history of the  
6 success of commissioning that's been found really  
7 not at the back-end, but at the front-end in the  
8 design process, and getting a more definitive kind  
9 of statement of design intent or project  
10 requirements, or whatever the term is going to be  
11 used in industry, getting in a clear specification  
12 that defines success for a project is where the  
13 value -- getting acceptance criteria established  
14 early on that can be used, if necessary, for  
15 testing purposes.

16 But it gets the designer focused; it  
17 gets the owner focused on what is important for  
18 that building.

19 And a lot of times that information is  
20 really not found -- does not find its way into the  
21 spec. And so if you want to influence the design  
22 process, I would encourage getting that kind of  
23 thing into code, so that specific criteria are  
24 defined.

25 And it doesn't have to be complicated.

1 It can be very straightforward. But it does  
2 establish a kind of a criteria for success. And  
3 if the code has certain key pieces that, you know,  
4 the energy performance of a building, we need  
5 people to define it, what they're shooting for,  
6 what their target is.

7 Anyway, I'm just trying to encourage  
8 looking at the front of the process, as well as  
9 the back of the process.

10 MR. ALCORN: Okay, any more comments?  
11 Are we adjourned for the day?

12 All right, well, I'd sure like to thank  
13 you all very much for the excellent comments and  
14 questions -- one more --

15 MR. PIERCE: Before we get out, what's  
16 the next activity then in the acceptance testing?

17 MR. ALCORN: Yeah, I was just about to  
18 say that tomorrow actually is our next workshop.

19 MR. PIERCE: On this --

20 MR. ALCORN: Oh, on this stuff here.  
21 Well, I guess we need to digest the comments that  
22 were taken in today, and work with Jeff on how  
23 we'll be incorporating and modifying the report.

24 And then I guess there will be a --  
25 we'll need to, you know, to repost that document

1 to the website. I'm not a hundred percent sure  
2 after that.

3 MR. PENNINGTON: You know, all of these  
4 proposals that we're reviewing now are going to be  
5 put into a draft standard. And, you know, we've  
6 gotten -- we're just getting our feet wet actually  
7 on the proposals that, you know, we've got the  
8 first six tomorrow out of 28. And so, you know,  
9 we've got a few more after that to do.

10 You can count on more than one workshop  
11 event after that.

12 MR. PIERCE: I know about the workshops  
13 and I'll be here tomorrow, but I mean --

14 MR. PENNINGTON: So on this particular  
15 topic this is going to go like the others is what  
16 I'm trying to say; is that, you know, the next  
17 step will be to draft the standard, and to put  
18 this into a draft standard, along with the other  
19 changes.

20 MR. PIERCE: So we won't see the next  
21 version before it's in the draft standard?

22 MR. PENNINGTON: Correct.

23 MR. AHMED: So I take it you mean for  
24 each of these measures you're just going to have  
25 one workshop session, and go straight to language

1 development?

2 MR. PENNINGTON: Correct.

3 MR. AHMED: Charles has got it easy.

4 Just one session.

5 MR. PENNINGTON: Does it feel like easy

6 to you, Charles?

7 (Laughter.)

8 MR. JOHNSON: Just, you know, to kind of

9 follow up on that, --

10 MR. ELEY: There's a little more than

11 just these workshops.

12 MR. JOHNSON: Yeah. You know, I guess

13 the thing that we're also interested in doing is

14 making sure that we're also saying, for example,

15 demand control ventilation is an issue that we're

16 working with the authors of that section to make

17 sure that things get into the right place in the

18 standards, so that it could be facilitated through

19 acceptance testing.

20 And I think we're also interested in --

21 to me, you know, there's some sort of the

22 unresolved, the longer term issues, I think, that

23 we're going to need to work on really have to do

24 with some of the training certification, some of

25 the implementation issues related to this.



1 I think in terms of we're really trying  
2 to anticipate issues at this phase, and making  
3 sure that we aren't locking ourselves into  
4 language or into processes that will be impossible  
5 to implement.

6 But at the same time I think there's  
7 some, there's going to be some challenges in  
8 actually turning this into practice, and that's  
9 going to be part of the standards process, or at  
10 least the hearings are going to be a way of  
11 getting some of that out, because people will hear  
12 about it.

13 And then SMACNA and others are going to  
14 become much more aware and more active in this.

15 But I think the other part will be, you know,  
16 working with folks to actually implement this.

17 MR. AHMED: Jeff, you did mention that  
18 you have, I think Larry mentioned that you have  
19 talked with contractors and owners. I was just  
20 wondering, I mean, have you taken a sample in sort  
21 of a field of what the owners think and  
22 contractors think about this process?

23 I mean not just in your own  
24 neighborhood, I'm talking about statewide.

25 MR. JOHNSON: Right, exactly. We did a

1 survey that was, you know, that we contacted  
2 people throughout the state and talked to them  
3 about what kinds of things they'd like -- what  
4 they didn't want as a part of this process. And  
5 this proposal was very much crafted from the  
6 results of that survey.

7 MR. AHMED: Okay.

8 MR. JOHNSON: We haven't gone back out  
9 to those same folks and said, oh, do you want to  
10 do that. And, in fact, this meeting today is  
11 partly intended to start to get public feedback on  
12 exactly what we are proposing.

13 And so this is really, we've had some  
14 informal meetings; we did some surveys early in  
15 the project. We've had this workshop. So, we're  
16 really starting to build that public record, this  
17 is really what this is all about. This is a part  
18 of that process.

19 MR. ALCORN: Okay.

20 MR. JOHNSON: Thank you.

21 MR. ALCORN: Anything else? I would  
22 like to remind everyone there is a workshop  
23 tomorrow. I think most of you know that. And the  
24 next workshop after that is slated for May 30th,  
25 so if you can put that one on your calendars, that

1 would be great.

2 We're adjourned, thank you very much.

3 (Whereupon, at 2:25 p.m., the workshop  
4 was concluded.)

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## CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter,  
do hereby certify that I am a disinterested person  
herein; that I recorded the foregoing California  
Energy Commission Workshop; that it was thereafter  
transcribed into typewriting.

I further certify that I am not of  
counsel or attorney for any of the parties to said  
workshop, nor in any way interested in outcome of  
said workshop.

IN WITNESS WHEREOF, I have hereunto set  
my hand this 1st day of May, 2002.

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345